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Rev. 07/10/02

EPA Contract No. 68-W8-0093
Work Assignment No. 17-5L4J
Donohue Project No. 20026

00099

VOLUME 4

HEALTH AND SAFETY PLAN

HIMCO DUMP
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
ELKHART, INDIANA

FINAL
JULY 1990

Prepared for:

U.S. Environmental Protection Agency
Emergency and Remedial Response Branch
Region V
230 South Dearborn Street
Chicago, Illinois 60604

PERFORMANCE OF REMEDIAL RESPONSE
ACTIVITIES AT UNCONTROLLED HAZARDOUS WASTE SITES (ARCS V)

U.S. EPA Contract No. 68-W8-0093
EPA Work Assignment No. 17-5L4J

HEALTH AND SAFETY PLAN FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY HIMCO DUMP

FINAL
JULY 1990

Prepared by: _____ July 12, 1990
Stephen L. Lombardo/Vanessa A. Harris — Date
Donohue & Associates, Inc.

Reviewed by: Pamela B. Markelz July 12, 1990
Pamela B. Markelz, CSS, CET — Date
Corporate Health and Safety Supervisor
Donohue & Associates, Inc.

Approved by: William L. Beckett July 12, 1990
William L. Beckett, CIH, CSP — Date
ARCS V Health & Safety Manager
Ebasco Services, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS
Himco Dump HASP
Elkhart, Indiana

ABN	Acid and Base-Neutral Semivolatile Organic Compounds
ASTM	American Society of Testing Materials
BNA	Base-Neutral and Acid Semivolatile Organic Compounds (same as ABN)
BOD	Biochemical Oxygen Demand
CDO	Central District Office, U.S. EPA Region V
CH_4	Methane
Cl	Chloride
CLP	Contract Laboratory Program
CN	Cyanide
COD	Chemical Oxygen Demand
COE	Corps of Engineers, U.S. Army
CRDL	Contract Required Detection Limit
CRL	Central Regional Laboratory, U.S. EPA Region V
CRQL	Contract Required Quantitation Limit
DO	Dissolved Oxygen
DQO	Data Quality Objective
E&E	Ecology & Environment, Inc.
EM	Electromagnetic Meter
EMSL	Environmental Monitoring and Support Laboratory, U.S. EPA
EPA	U.S. Environmental Protection Agency
FIT	Field Investigation Team
FS	Feasibility Study
FSP	Field Sampling Plan
FTL	Field Team Leader, Donohue
GC/MS	Gas Chromatography/Mass Spectrometry
GFAA	Graphite Furnace Atomic Absorption
HNO_3	Nitric Acid
HNu	Photoionization detector manufacturer
HQ	Headquarters, U.S. EPA
H_2S	Hydrogen Sulfide
IADS	Inorganic Analysis Data Sheet
ICP	Inductively Coupled Argon Plasma Spectrometer
I.D.	Inner Diameter
IDEM	Indiana Department of Environmental Management
IDL	Instrument Detection Limit
ISBH	Indiana State Board of Health
LSSS	Laboratory Support Services Section, U.S. EPA Region V
Lumidor	Gas monitoring device manufacturer
MCL	Maximum Contaminant Level
NC	Not Calculated
NEIC	National Enforcement Investigations Center, U.S. EPA
NH_3	Ammonia Nitrogen
NO_2+NO_3	Nitrite + Nitrate Nitrogen

ACRONYMS

Himco Dump HASP
Elkhart, Indiana

NPL	National Priorities List
OADS	Organic Analysis Data Sheet
OERR	Office of Emergency and Remedial Response, U.S. EPA
PCBs	Polychlorinated Biphenyls
PCB/P	PCBs and Pesticides
pH	Measure of acidity indicated as log of hydrogen ion concentration
PM	Project Manager, Donohue
PRP	Potentially Responsible Party
PVC	Polyvinyl Chloride
QA	Quality Assurance
QAMS	Quality Assurance Management Staff, U.S. EPA
QAPP	Quality Assurance Project Plan
QC	Quality Control
%R	Percent Recovery
RAS	Routine Analytical Services
RI	Remedial Investigation
RMCL	Recommended Maximum Contaminant Level
RPD	Relative Percent Difference
RPM	Remedial Project Manager, U.S. EPA
RPO	Remedial Project Officer, U.S. EPA
RSCC	Regional Sample Control Center, U.S. EPA
SAS	Special Analytical Services
SM	Site Manager, Donohue
SMO	Sample Management Office
SO_4	Sulfate
SOP	Standard Operating Procedure
SOW	Statement of Work
SQCO	Site Quality Control Officer, Donohue
TAC	Technical Advisory Committee, Donohue
TAL	Target Analyte List
TCL	Target Compound List
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TP	Total Phosphorus
TSQAM	Technical Services Quality Assurance Manager, Donohue
TSS	Total Suspended Solids
USGS	United States Geological Survey
VOA	Volatile Organic Compounds
VOC	Volatile Organic Compounds (same as VOA)

1.0 GENERAL

This Health and Safety Plan (HASP) has been prepared in accordance with the ARCS V Program Health and Safety Guideline HAS-1, and the regulatory requirements of 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response." It addresses those activities associated with the Remedial Investigation/Feasibility Study to be conducted at the Himco Dump Site located in Elkhart, Indiana, under U.S. Environmental Protection Agency (EPA) work assignment 17-5L4J. The HASP will be implemented by the Health and Safety Officer (HSO) and the Assistant HSO during site work.

Compliance with this HASP is required of all personnel who enter this site. Assistance in implementing this plan can be obtained from the Company Health and Safety Supervisor (CHSS) and/or the ARCS V Health and Safety Manager (HSM).

The content of this HASP may change or undergo revision based upon additional information made available to health and safety (H&S) personnel, monitoring results, or changes in the technical scope of work. Any changes proposed must be approved by the CHSS and the HSM.

SCOPE OF WORK:

1) Geophysical Survey
2) Wetlands Delineation
3) Soil Sampling
4) Waste Mass Gas Sampling
5) Soil Borings/Monitoring Well Installations
6) Monitoring Well Development, Slug Tests, and Sample Collection Activities
7) Staff Gauge Installation
8) Sediment and Surface Water Sampling
9) Survey
10) Test Pits

SITE MANAGER

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2.0 ASSIGNMENT OF HASP RESPONSIBILITY

The following describes the health and safety designations and general responsibilities which will be employed for the Himco, Inc. Dump RI/FS field investigation. A project organization diagram is presented in Figure 2-1.

2.1 COMPANY HEALTH AND SAFETY SUPERVISOR (CHSS)

The CHSS has overall responsibility for development and implementation of this HASP. The CHSS also serves as the site Health and Safety Officer (HSO). The CHSS shall approve any changes to this plan due to modification of procedures or newly proposed site activities.

The CHSS will be responsible for the development of new company safety protocols and procedures necessary for field operations and will also be responsible for the resolution of any outstanding safety issues which arise during the site work. Health and safety-related duties and responsibilities will be assigned only to qualified individuals by the CHSS. Before personnel may work on site, a current medical examination and acceptable health and safety training must be approved by the CHSS.

2.2 SITE ASSISTANT HEALTH AND SAFETY OFFICER

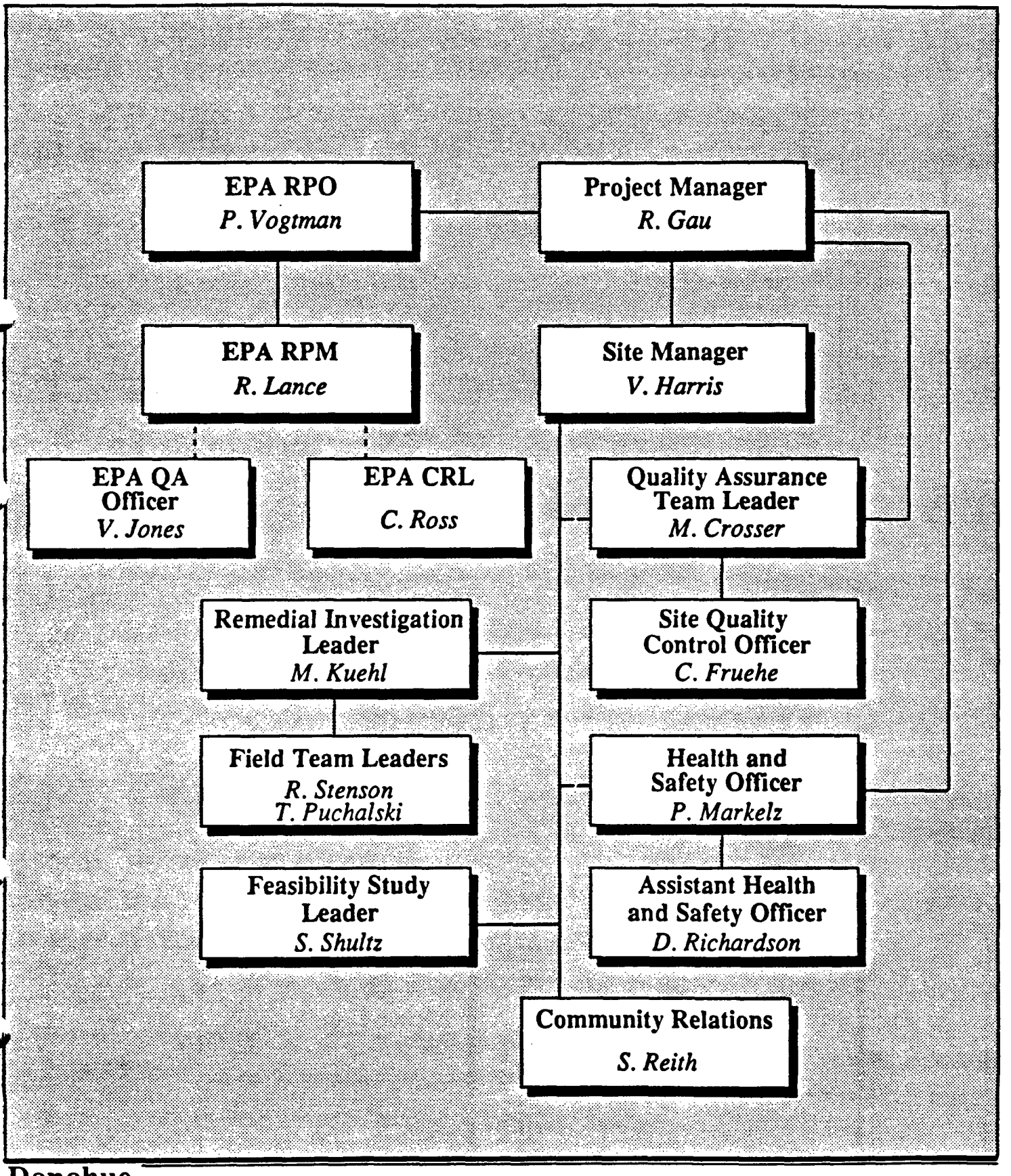
Since the site has been identified as low to moderate hazard, the HSO shall direct the site health and safety efforts through an Assistant Health and Safety Officer (Assistant HSO). The Assistant HSO will be responsible for implementing of the HASP. The Assistant HSO has stop-work authorization which he will execute upon determination of an imminent safety hazard, emergency situation, or other potentially dangerous situations, such as detrimental weather conditions. Authorization to proceed with work will be issued by the CHSS/HSO in conjunction with the Site Manager after such action.

2.3 HEALTH AND SAFETY MANAGER (HSM)

The HSM will approve site-specific HASPS and provide periodic audits of field team compliance with the HASP and company health and safety policy. The HSM provides liaison with U.S. EPA, OSHA, and other governmental agencies on issues of health and safety. The HSM monitors the employee training requirements and updates the health and safety program guidelines when necessary.

2.4 SUBCONTRACTORS

Subcontracts will be issued for various investigative tasks at the site. Subcontractors shall comply with the requirements outlined in this HASP and in accordance with OSHA 29 CFR 1910 and 29 CFR 1926, but, in all cases, pool subcontractors shall be responsible for site safety related to or affected by their own field operations.



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June 1990

PROJECT ORGANIZATION

HIMCO DUMP
ELKHART, INDIANA

Engineers■Architects■Scientists

FIGURE 2–1

3.0 SITE BACKGROUND AND SETTING

3.1 LOCATION, SITE HISTORY, AND PAST RESPONSE ACTIONS

2.1.1 Location

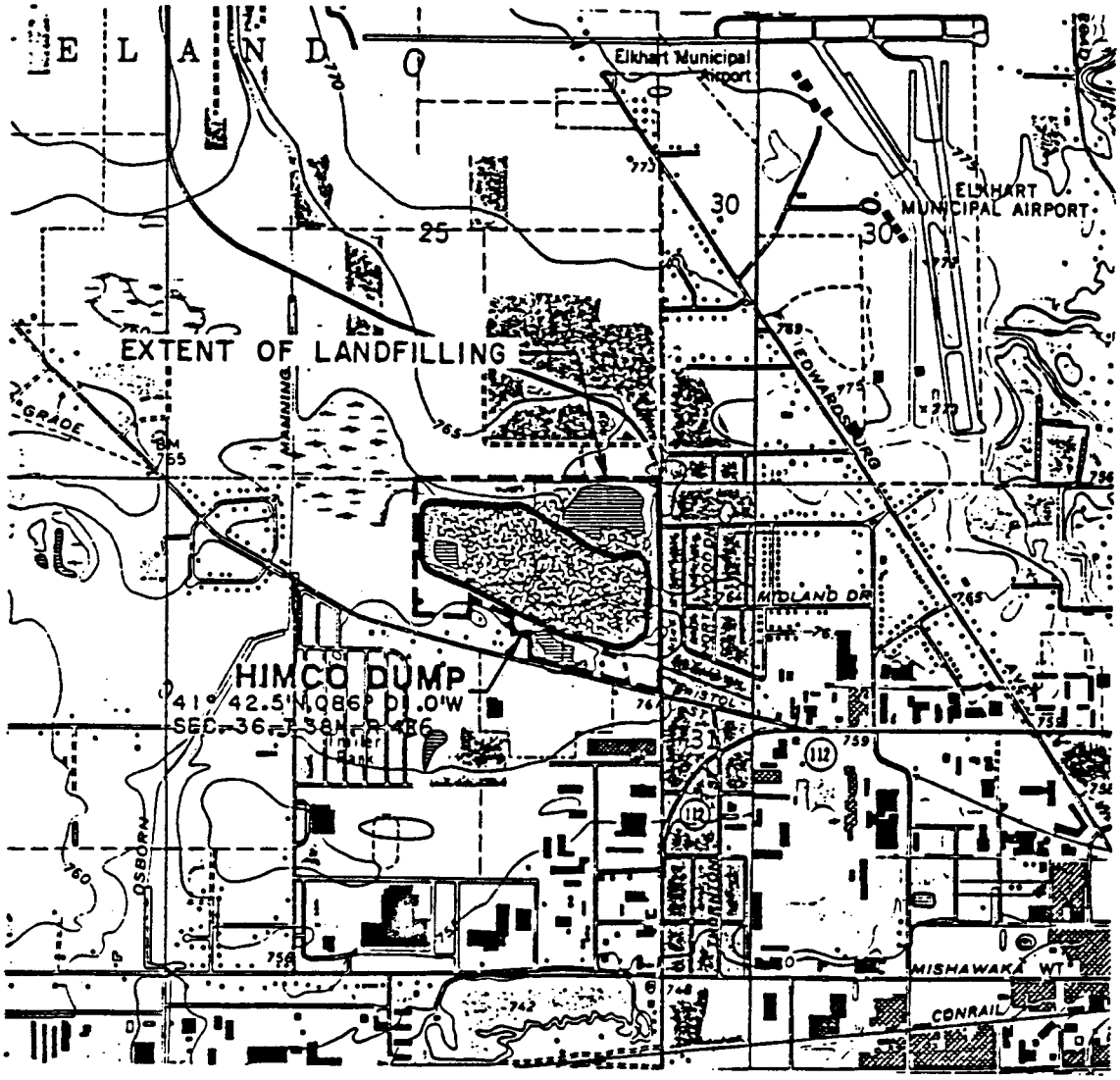
The Himco Dump site is a closed and covered landfill located at County Road 10 and the Nappanee Street extension in the town of Elkhart, located in Elkhart County, Indiana (Figure 3-1). The site covers approximately 50 acres in the Northeast quarter of Section 36, Township 38 North, Range 4 East, in Cleveland Township. The site is bounded on the north by a tree line and northernmost extent of the gravel pit pond; on the west by the fish pond; on the south by County Road 10 and the private residences; and on the east by the Nappanee Street extension. The vicinity of the site is agricultural, residential, and light industrial.

3.1.2 Site History and Response Actions

The Himco Dump site was privately operated by Himco Waste Away Service, Inc. that was in operation between 1960 and September 1976. A brief history of the Himco Dump site was provided by Chuck Himes, principal landfill operator during the site visit on November 9, 1989. The area was initially a marsh and grassland. There was no liner, and no leachate, or gas recovery system constructed for the landfill. Refuse was placed at ground surface across the site with the exception of trench filling in the eastern quarter of the site. A total of five trenches 10-15 feet deep, a truck width wide and 30 feet long, were excavated in this area. Paper refuse was reportedly dumped in these trenches and burned. The landfill had no borrow source but obtained sandy soil for daily cover from the gravel pit to the north, an excavated pond to the west, and essentially anywhere around the perimeter of the site where sand was available. It was reported that essentially two-thirds of the waste present in the dump was calcium sulfate from Miles Laboratories. As much as 360 tons/day were dumped over an unknown time duration. Other wastes accepted at the landfill included demolition/construction debris, industrial and hospital wastes, and to a minor degree, general household refuse. In 1977, the landfill was closed and covered. The cover was constructed of approximately one foot of sand overlying six inches of calcium sulfate.

In 1971, the Indiana State Board of Health (ISBH) first identified the Himco site as an open dump. In early 1974, residents nearby the Himco Dump complained to the ISBH about color, taste, and odor problems with their shallow wells.

Mr. Himes was advised by ISBH to replace six shallow water wells for residences immediately south of the landfill on County Road 10. Analyses of these wells by the state showed high levels of manganese. The old wells were finished at depths of approximately 22 feet, and the new wells were finished at depths ranging from 152 to 172 feet below ground surface.



QUADRANGLE LOCATION

SOURCE: USGS 7.5 MIN. QUAD ELKHART, INDIANA, 1961
PHOTOREVISED 1981

0 1000 2000
SCALE: FT.

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SITE LOCATION MAP

N

MAY, 1990

HIMCO DUMP SITE
ELKHART COUNTY, INDIANA

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FIGURE 3-1

In 1975, Mr. Himes signed a consent agreement with the ISBH Stream Pollution Control Board to close the dump by September of 1976. The final cover consisted of calcium sulfate overlain by sand.

In 1980, the United States Geological Survey (USGS) conducted a hydrogeological study of northwestern Elkhart County, Indiana. The purpose of the USGS study was to define the hydrogeology in the region and to determine the hydrologic effects of the proposed pumping at the Elkhart Municipal Airport located approximately one mile northeast of the Himco Dump. Data collected on the groundwater regime included the thickness and areal extent of unconsolidated deposits, their hydraulic conductivity, specific yield, transmissivity, and storage coefficients. The general groundwater flow patterns and stream-aquifer connections were also defined (USGS, 1981). The USGS report also determined the horizontal and vertical extent of the leachate plume from the Himco Dump using concentrations of bromide in the groundwater. The bromide concentrations in groundwater have been monitored from 1979 until present.

In 1984, a field investigation team (FIT) from Ecology and Environment conducted a site inspection at the Himco Dump. Laboratory analysis of wells sampled by the FIT members showed that the groundwater was impacted by metals and semi-volatile and volatile organic compounds. The metals detected included aluminum, arsenic, barium, chromium, cobalt, selenium, beryllium, cadmium, copper, zinc, manganese, lead, nickel, and mercury. The volatile and semivolatile organic compounds detected included: acetone, benzene, phenol, freons, 4-methylphenol, trans 1,2-dichloroethane, 2-butanone, chloroethane, and pyrene. At the time of the site inspections, leachate streams were observed by the FIT members.

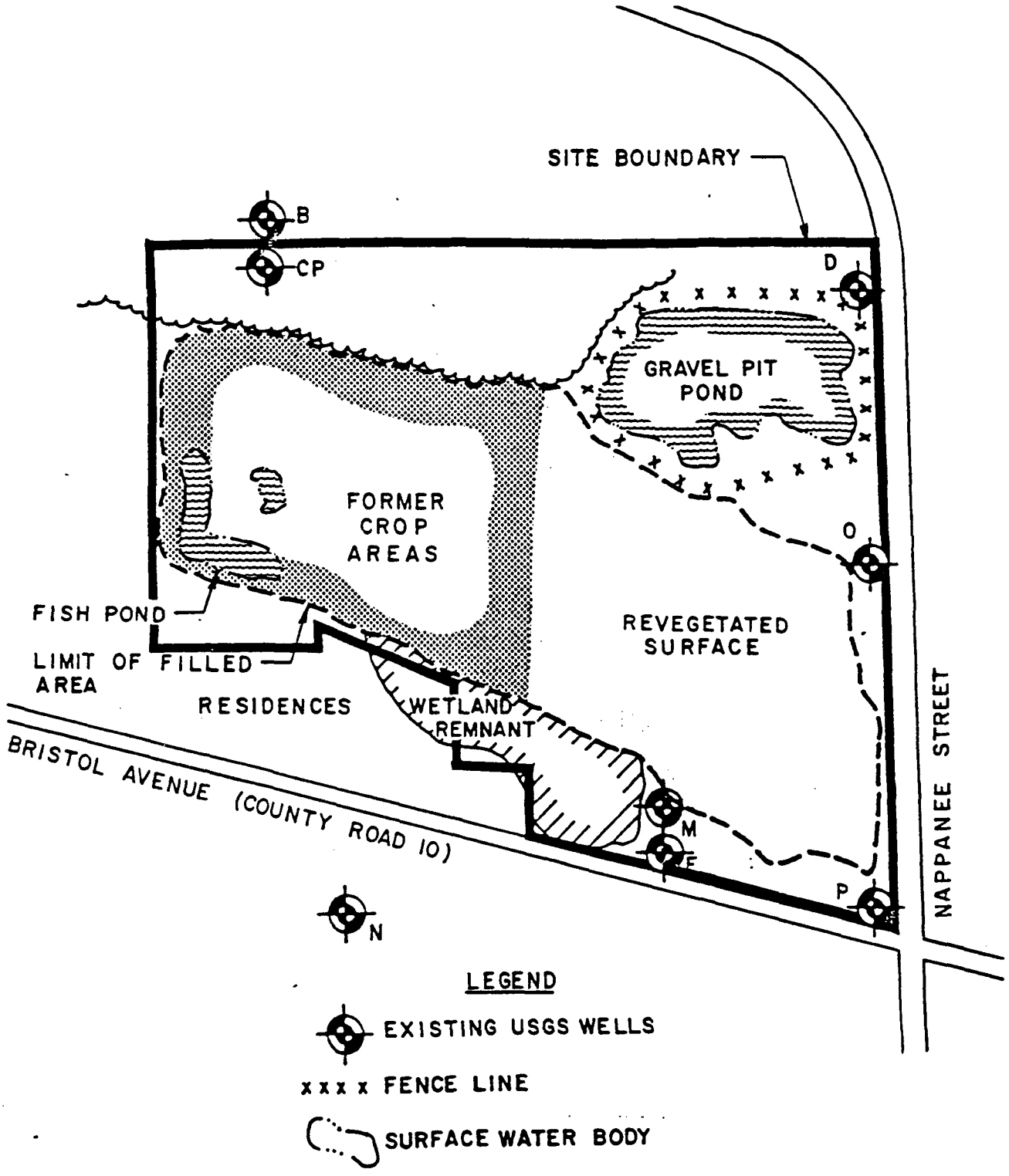
As of January 1990, the parcels of land which comprise the landfill are owned by the following individuals or corporations (as shown on Plan Sheet 1 in the Work Plan):

I. Miles Laboratories
II. CLD Corporation
III. Alonzo Craft, Jr.
IV. Indiana and Michigan Electric Co.

3.1.3 Current Conditions

Site features and existing monitoring wells are shown in Figure 3-2.

Donohue conducted a site visit on November 9, 1989 to the Himco Dump with representatives of the Indiana Department of Environmental Management (IDEM) and the potentially responsible parties (PRPs). The purpose of the site visit was to observe obvious surficial areas of environmental concern (e.g., stressed vegetation, stained soils, and uncontrolled dumping), determine site access points for field operations, and inspect the final cover for uncovered refuse and surface water drainage patterns.



EXISTING SITE FEATURES

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HIMCO DUMP SITE
ELKHART COUNTY, INDIANA

N

FIGURE 3 – 2

During the site visit the final cover of sand overlying calcium sulfate was observed. The thickness of sand across the site was observed to be 0-1 feet thick. The thickness of the calcium sulfate layer is unknown. The western half of the dump was used as cropland (for soybeans) up to one year ago. The eastern half of the site is covered by grassland with some tree stands. There is an access road (made of sand) into the site near the intersection of County 10 and Nappanee Street. There is an abandoned gravel pit operation in the northeast corner of the site. A truck scale, concrete structures, and a utility pole are in this area. The gravel pit itself is filled with water, and a steep drop-off was observed. Some minor dumping into the gravel pit pond was noted. Another pond exists in the southwest corner of the site. It was reported that the owner of the property excavated this area to create a "fishing hole" which was then stocked with fish. It is not known if any biota still exist in this pond.

Surface water drainage across the Himco Dump site is probably radial due to the configuration of the landfill. The highest point of the landfill is probably near its geographic center at a reported height of 15 feet above ground surface sloping to a height of 0-5 feet around the dump's perimeter. Erosional areas were noted around the site, some of them penetrating the calcium sulfate layer. Paper and plastic refuse also lay uncovered in certain areas. There were also deep caverns noted in areas that were initially created by burrowing rodents. Wildlife observed at the site included a four-point buck and various species of birds.

On-site and off-site monitoring wells installed by the USGS were also inspected by Donohue during the site visit. The wells were constructed of two-inch and four-inch ID PVC and had no protective casings. All wells checked had water in them, and these water levels were recorded. These wells were reported to have been constructed in the early 1980s.

An initial walk-through of the site was conducted with atmospheric monitoring equipment (an HNu, Lumidor, and geiger counter). Compounds monitored included: volatile organic compounds (VOCs), hydrogen sulfide, methane, X and gamma radiation. No readings above background were detected on any of the instruments. However, olfactory detection of "landfill gas" did occur intermittently across the dump site.

4.0 HAZARD ASSESSMENT

4.1 WASTE DESCRIPTION/CHARACTERIZATION

The following chemical information is presented in order to identify the types of materials that may be encountered at the Himco Dump project. The detailed information on these materials was obtained from:

- ACGIH, Threshold Limit Values and Biological Exposure Indices for 1989-1990
- Hazardline
- Chemical Data Sheets and Hazardlines
- NIOSH Pocket Guide to Chemical Hazards - 1987.

The following is a list of compounds that are potentially found on site. Appendix A includes a Chemical Data Sheet and/or Hazardline for the compounds listed below, providing information such as the compounds characteristics, health hazards, protection, exposure limits, and first aid procedures. These compounds include:

Heavy Metals: Al, As, Br, Cr, Co, Cu, Fe, Pb, Mn, Ni, Zn

Volatiles:
Acetone
2-butanone
Chlorofluoromethane
Dichlorodifluomethane
Trans 1,2-dichloroethane

Semi-Volatiles:
Phenol
4-methyphenol

Waste Types: Liquid _____ Solid __X__ Gas __X__
Sludge _____ Semi-solid _____ Other _____

Characteristics: Corrosive _____ Flammable _____
Explosive _____ Volatile __X__
Radioactive __X__ Inert _____
Other __Toxic__

4.2 DEGREE OF HAZARD

On-site hazards at the Himco Dump site include physical and chemical hazards.

The contaminants of concern at the site can affect the body if they are inhaled, come in contact with the eyes or skin, or are ingested. These compounds may be released during waste mass gas sampling, soil sampling, monitoring well installations, monitoring well development, slug testing, well sampling activities, surface water and sediment sampling, and wetlands delineation. The primary concern is for skin exposure to contaminated soils and

water and potential inhalation of organic vapors released during soil intrusive activities. Exposure to these substances by inhalation (in the breathing zone) is not anticipated due to the levels found in the soil and water during recent studies. Atmospheric monitoring, however, will be conducted during most phases of on-site field activities to determine the need for upgrading to appropriate levels of respiratory protection. Exposure by skin absorption is a low to moderate possibility, but can be prevented by use of proper protective equipment and good hygiene practices.

Soil boring and monitoring well installation activities provide the potential for encountering buried hazards such as utilities. Clearance shall be obtained from utility companies prior to digging. Overhead electrical lines shall also be identified. Additionally, workers should stand upwind of the exhaust while soil gas sampling is taking place.

Physical hazards which may be encountered at the Site during field activities include overhead and tripping hazards associated with drill rig operations. Care must be taken when walking on the landfil surface to avoid sharp protrudihg oebjects. Wearing steel toe, steel work boots will help prevent this.

Depending on seasonal weather conditions, there is some potential for workers on-site to be affected by heat stress if site activities are scheduled for the summer months or cold exposure if activities are conducted during winter months. Refer to Appendix B for heat stress and cold exposure monitoring guidelines. The Assistant HSO will monitor for heat stress or cold exposure.

Noise related to soil boring operations during monitoring well installations is expected to be minimal. However, if noise becomes a problem the Assistant HSO will monitor for noise levels and appropriate use of ear defenders will be implemented. Appropriate hearing protection (i.e., ear defenders) will be worn when noise levels exceed allowable levels of 85 dB time weighted average for eight hours (OSHA 29 CFR 1910.95 & ACGIH).

5.0 TRAINING REQUIREMENTS

5.1 BASIC TRAINING REQUIRED

All personnel who are required to work in areas where the potential for toxic exposure exists shall complete training or site experience conforming to the requirements of 29 CFR 1910.120 (e). Contractors/subcontractors shall provide written documentation that these training/experience requirements have been met. All personnel shall also be trained in the contents of Appendix C, RESPIRATOR PROGRAM.

5.2 ADVANCED TRAINING

Advanced training as necessary will be provided to any personnel who will be expected to perform site work utilizing Level A protection or other specialized operations to be undertaken at the site.

5.3 SITE-SPECIFIC TRAINING

Site-specific training will be provided that will address the activities, procedures, monitoring, and equipment for the Himco Dump site operations. This training will include site layout, hazards, and emergency procedures at the site, and will detail all provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safe operations. Training must include emergency preparedness, location of assembly areas, proper entry and exit procedures for exclusion zone, warning systems, location of emergency equipment and route to hospital.

5.4 SAFETY BRIEFINGS

Project personnel will be given briefings by the HSO or Assistant HSO on a daily or as-needed basis to further assist site personnel in conducting their activities safely. Briefings will be provided when new operations are to be conducted, changes in work practices must be implemented due to new information made available, or if site or environmental conditions change. Briefings will also be given to facilitate conformance with prescribed safety practices when performance deficiencies are identified during routine daily activities or as a result of safety audits.

5.5 SAFETY AUDITS

The HSM and/or the CHSS shall conduct regular safety audits of field operations and subcontractor performance to review for compliance with ARCS Region V health and safety policies and procedures. The health and safety audit findings will be documented and corrective action taken.

5.6 FIRST AID AND CPR

At least two individuals per shift shall be trained and qualified to administer first aid and CPR.

The HSO will identify those individuals requiring this training in order to ensure that emergency treatment is available during every workshift from a person qualified in first aid and CPR. These courses will be consistent with requirements of the American Red Cross and/or American Heart Association.

6.0 MEDICAL SURVEILLANCE PROGRAM

All Donohue personnel and subcontractors performing field work at the Himco Dump Site will be required to have passed a pre-assignment and/or periodic medical examination that is consistent with 29 CFR 1910.120(f). A release for work will be confirmed by the HSO before an employee can begin hazardous site activities. The exam will be taken annually at a minimum and upon termination of ARCS V work.

Additional medical testing may be required by the CHSS in consultation with the company physician and the ARCS V HSM if an overt exposure or accident occurs, or if other site conditions warrant further medical surveillance.

Contractors/subcontractors will maintain the medical records for their own employees, but shall also provide the HSO with written documentation certifying that each employee at the site has met the requirements of the Medical Surveillance Program. This documentation will be provided prior to the first day of work for each employee assigned to the Himco Dump Site. The pre-assignment and annual examinations are essentially the same in content and will include:

- An updated medical and occupational history
- A screening physical examination
- Blood and urine laboratory tests
- Chest x-ray
- Electrocardiogram
- Pulmonary function tests
- Audiometry
- Visual acuity test.

6.1 EMERGENCY MEDICAL TREATMENT

Provisions for emergency medical treatment shall be integrated with the overall site Emergency Plan and shall include:

- At least two individuals per shift qualified to render first aid and CPR.
- Emergency first aid stations in the immediate work vicinity.
- Conspicuously posted phone numbers and procedures for contacting ambulance services, fire department, police, and medical facilities.
- Maps and directions to medical facilities.

7.0 SITE CONTROL MEASURES

At the Himco Dump Site, site control zones as presented in Figure 7-1 will include an exclusion zone (EZ), contamination reduction zone (CRZ), Support Zone (SZ), and an equipment decontamination pad.

7.1 EXCLUSION ZONE (EZ)

The EZ is the area containing or suspected of containing contaminated materials. Since investigation activities will be conducted throughout the entire property, the entire project site boundary shall be delineated as the EZ.

7.1.1 Work Zones

7.1.1.1 Borings/Monitoring Wells

Temporary activity-specific work zones (WZ) as presented in Figure 7-2, shall be established at each monitoring well installation. During monitoring well installation each WZ shall be established and marked by safety rope or tape. The WZ shall include a 30-foot or larger radius encompassing the drill rig. A contamination reduction zone (CRZ) shall be placed at the WZ perimeter at an upwind location. A portable eye wash unit, first aid kit, towels, plastic garbage bags, and decon supplies shall be placed in this CRZ.

7.1.1.2 Sample Collection and Slug Testing

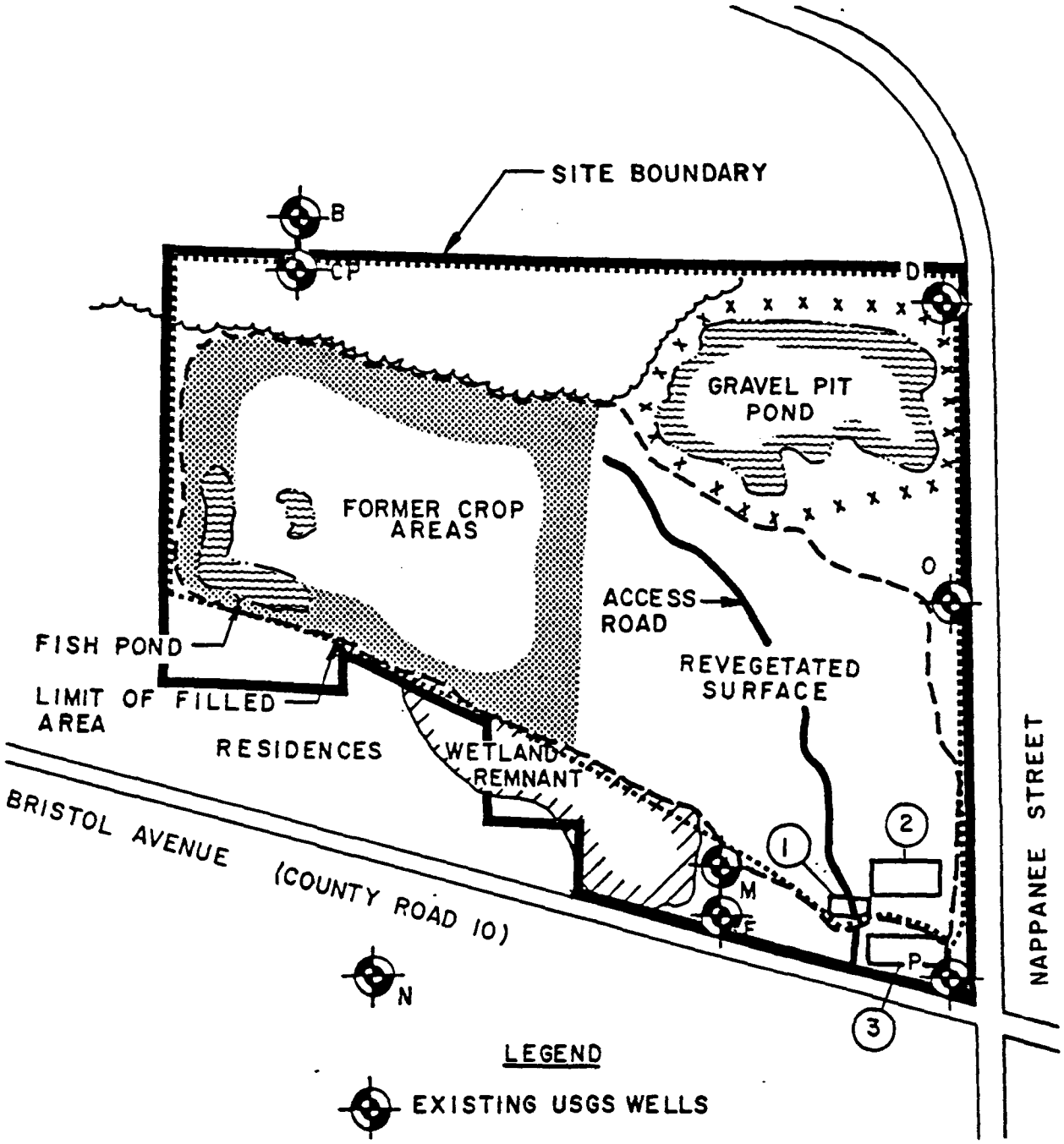
A temporary WZ shall be established at each sampling location where surface and subsurface soils are to be collected and where monitoring well development, slug testing and sample collection activities occur. The WZ areas shall be established by laying about 5 square feet of plastic sheeting next to the sampling location for the placement of equipment and supplies. A portable eye wash, first aid kit, towels, plastic garbage bags, and decon supplies are also required in this area.

7.1.1.3 Trenching/Test Pit

The trenching contractor will be responsible for establishing a work zone (WZ) to restrict access to the area where trenching will occur (Figure 7-3). A portable eyewash first aid kit, towels, and plastic garbage bags are also required in the WZ.

7.2 PERSONNEL CONTAMINATION REDUCTION ZONE

A Personnel Contamination Reduction Zone (PCRZ) will be established between the Exclusion Zone and the Support Zone. The PCRZ will contain the Contamination Reduction Corridor (CRC) and will provide for personnel and portable equipment decontamination. The PCRZ is to be used for general site entry and egress.



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SITE CONTROL ZONES

HIMCO DUMP SITE
ELKHART COUNTY, INDIANA

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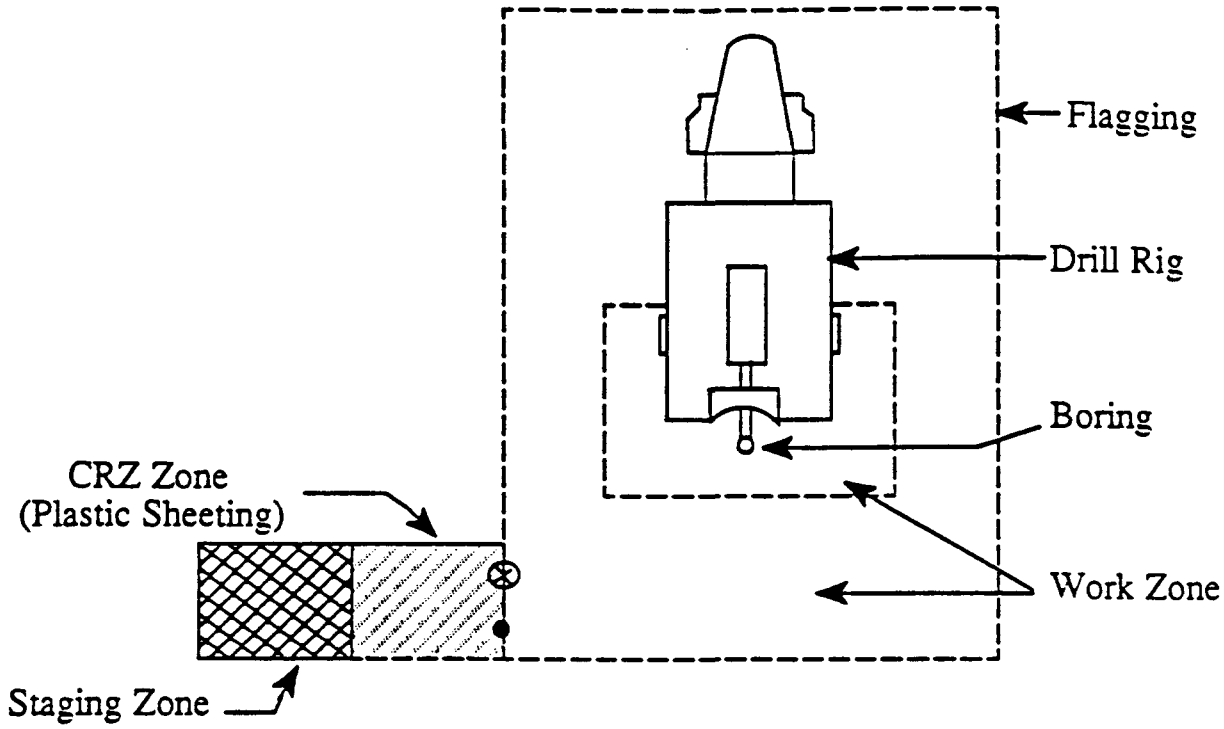
FIGURE 7-1



NOTES:

1. The CRZ Zone will contain:
   - Portable Emergency Eyewash Unit
   - First Aid Kit
   - Fire Extinguisher
   - Towels/Wipe Cloths
2. ⊗ = Entry/Exit Point
3. • = 55-Gallon Drum/Plastic Bag
4. The staging zone (if applicable) will contain support zone activities and personnel transport vehicles

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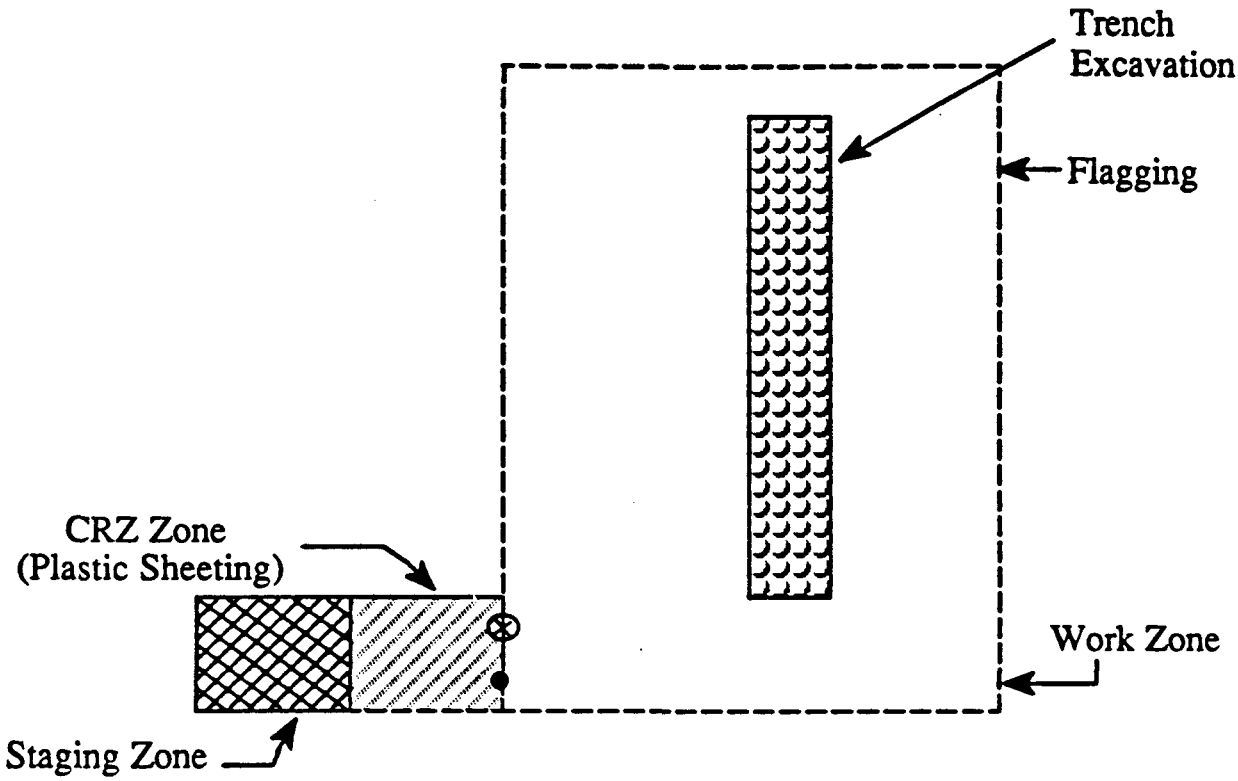
LAYOUT OF WORK ZONE

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

HIMCO DUMP SITE
ELKHART COUNTY, INDIANA

FIGURE 7–2



NOTES:

1. The CRZ Zone will contain:
   - Portable Emergency Eyewash Unit
   - First Aid Kit
   - Fire Extinguisher
   - Towels/Wipe Cloths
2. ⊗ = Entry/Exit Point
3. ● = 55-Gallon Drum/Plastic Bag
4. The staging zone (if applicable) will contain support zone activities and personnel transport vehicles

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June 1990

LAYOUT OF TRENCH WORK ZONE
HIMCO DUMP SITE
ELKHART COUNTY, INDIANA

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FIGURE 7–3

g:4/Mariaiz/Box 8

7.3 EQUIPMENT DECONTAMINATION PAD

To prevent off-site transport of contamination, drill rigs and associated equipment and vehicles will be decontaminated at a fixed temporary decon pad prior to exiting the exclusion zone. Drilling equipment (augers, rods, etc.) will be steam-cleaned at the fixed decon pad as necessary. The fixed decon pad will be set up by the drillers and will be located near the site entrance at the corner of County Road 10 and Nappanee Street as shown in Figure 7-1. Decontamination liquids will be collected and discharged to the municipal waste water treatment system.

7.4 SUPPORT ZONE

The Support Zone is considered the uncontaminated area and will be separated from the CRZ by the "Contamination Control Line." It will contain the Command Post which will provide for team communications and emergency response. Appropriate sanitary facilities, safety, medical, and support equipment will be located in this zone. The majority of site operations will be controlled from this location as well as site access of authorized persons. No potentially contaminated personnel or materials are allowed in this zone except for appropriately packaged/decontaminated and labelled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat stress and cold exposure.

8.0 PERSONAL PROTECTIVE EQUIPMENT

8.1 GENERAL

The level of protection to be worn by field personnel will be defined and controlled by the HSO. Personal protective equipment for general operations will be consistent with the requirements of 29 CFR 1910 Subpart I, "Personal Protective Equipment." Basic levels of protection for hazardous waste operations will be selected in accordance with the provisions of 29 CFR 1910.120(g)(3), "Personal Protective Equipment Selection," and Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear." Modification to basic protective equipment ensembles may be necessary for specific operations. In these cases, further definition will be provided by review of specific hazards, conditions, and proposed operational requirements, and by conducting monitoring at the particular operation. Protection may be upgraded or downgraded, as deemed appropriate by the HSO.

8.2 ANTICIPATED LEVELS OF PROTECTION FOR SITE OPERATIONS

Task 1:	Geophysical Survey	D
Task 2:	Wetlands Delineation	D
Task 3:	Soil Sampling	D/C
Task 4:	Waste Mass Gas Sampling	D/C
Task 5:	Monitoring Well Installations	D/C
Task 6:	Monitoring Well Development, Slug Testing and Sample Collection Activities	D/C
Task 7:	Staff Gauge Installation	D
Task 8:	Sediment and Surface Water Sampling	D
Task 9:	Survey	D
Task 10:	Test Pits/Trenching	B
Task 11:	Cone Penetrometer Test	D/C

Level D personal protective clothing and equipment includes:

1) Polycoated tyvek coveralls - required in sampling areas when splashing by contaminated soils or water is a possibility.

2) Hardhat (when overhead hazards exist).

3) Safety glasses or goggles.

4) Steel toe, steel shank boots.

5) Disposable latex gloves - required when handling and collecting soil and water samples.

6) Outer nitrile gloves - required when handling and collecting soil and water samples.

7) Disposable outer boots - required when walking in areas of contaminated soils.

Level C protective clothing and equipment includes:

1) Full face air-purifying respirator (NIOSH/MSHA approved) fitted with acid gas/organic vapor/HEPA cartridges.

2) Polycoated tyvek coveralls with hood.

3) Disposable latex inner gloves.

4) Nitrile outer gloves.

5) Steel toe, steel shank boots.

6) Disposable outer boots.

Level B protective clothing and equipment includes the above Level C clothing with the addition of a self-contained breathing apparatus (SCBA) or supplied air-line respirator in place of an air-purifying respirator. Seams on Tyvek coveralls will be sealed with duct tape.

Action levels used to determine the need to upgrade or downgrade the levels of protection are described in Section 9.2 of this HASP.

9.0 AIR MONITORING

9.1 GENERAL

It will be necessary to monitor the atmospheric conditions during all on-site field sampling activities to determine the possible need to upgrade the personal protection of on-site workers. Atmospheres in the breathing zone, at the sample extraction point, and soil cuttings and fluids produced during drilling shall be monitored.

9.1.1 Geophysical Survey

This activity shall be conducted in Level D protection. Atmospheric monitoring will not be necessary since the geophysical survey will not require soil intrusive activities.

9.1.2 Wetlands Delineation

This activity shall be conducted in Level D protection. This activity will include shallow soil sampling but will be away from the landfill waste mass, therefore, atmospheric monitoring will not be required.

9.1.3 Soil Sampling

These activities shall be initiated in Level D protection with the contingency to upgrade the level of protection based on the action levels.

Monitoring shall be conducted continuously during the sampling activities. An Organic Vapor Analyzer (OVA) or Photoionization Detector (HNu) shall be used to monitor the breathing zone and the sampling extraction point. A Lumidor will also be used to monitor for methane and hydrogen sulfide in the breathing zone. A geiger counter shall also be used to check for the presence of radioactive waste materials.

9.1.4 Waste Mass Gas Sampling

These activities shall be initiated in Level D protection with the contingency to upgrade the level of protection based on the action levels.

Monitoring during waste mass gas sampling shall be conducted using an (OVA or (HNu. The breathing zone, the soil gas hole, and the sampling exhaust shall be monitored. A Lumidor will also be used to monitor for methane and hydrogen sulfide in the breathing zone.

9.1.5 Soil Boring Operations/Monitoring Well Installations

These activities shall be initiated in Level D protection with the contingency to upgrade the level of protection based on the action levels.

Monitoring shall be performed continuously during the drilling activities. An OVA or HNu shall be used to monitor the breathing zone, the borehole, and all geological samples upon their retrieval. Drill cuttings and fluids produced during drilling shall also be monitored. A Lumidor gas detector shall be used to monitor the borehole for the presence of combustible gases, oxygen, hydrogen sulfide. Any soil cuttings or fluids produced during drilling shall also be monitored using the HNu or OVA, a and a geiger counter to check for the presence of radioactive materials.

9.1.6 Monitoring Well Development, Slug Testing, and Sample Collection Activities

These activities shall be initiated in Level D protection with the contingency to upgrade the level of protection based on the action levels.

Monitoring shall be performed using an OVA or HNu and the Lumidor. The HNu and Lumidor shall be used to monitor the breathing zone and the well casing. Prior to well development, slug testing, or sample collection, the sampling team will stand upwind of the well casing when removing the well cap, stand back, and allow the well casing to vent for about 5 minutes. If action levels are not exceeded in the breathing zone, development and/or sampling activities may occur.

9.1.7 Staff Gauge Installation

These activities shall be conducted in Level D protection. Atmospheric monitoring will not be necessary since survey activities will not require soil intrusive activities.

9.1.8 Surface Water/Sediment Sampling

Surface water and sediment samples will be collected from shore at three surface water bodies located on-site. It will not be necessary to conduct atmospheric monitoring because these activities will take place away from the landfill waste mass.

9.1.9 Survey Activities

These activities shall be conducted in Level D protection. Atmospheric monitoring will not be necessary since survey activities will not require soil intrusive activities.

9.1.10 Trenching/Test Pits

Test pit excavation will be performed by Pool Subcontractor with Donohue oversight. Donohue staff for this task will comply with subcontractor's HASP for operation of heavy equipment. These activities shall be conducted in Level B protection.

Real-time perimeter monitoring will be conducted during the trenching activities. Monitoring will be conducted using an HNu or OVA at a minimum of once a day during work activities and whenever real-time monitoring action levels are exceeded in the work zone. Perimeter monitoring will be conducted at an upwind and downwind location and will be recorded on a daily basis.

If monitored levels of organic vapors reach action levels in the work zone, all related field activities that contribute to the monitored concentrations will be temporarily stopped until atmosphere in the work zone dissipates. In the event the atmosphere in the work zone does not clear, the trench area will be backfilled immediately to contain the contaminants, and a work-stop will occur to facilitate the appropriate corrective actions.

9.1.11 Cone Penetrometer Test

The cone penetrometer test shall be initiated in Level D protection with the contingency to upgrade the level of protection based on action levels.

Monitoring shall be conducted continuously during the sampling activities. An Organic Vapor Analyzer (OVA) or Photoionization Detector (HNu) shall be used to monitor the breathing zone. A Lumidor will also be used to monitor for methane and hydrogen sulfide in the breathing zone. A geiger counter shall also be used to check for the presence of radioactive waste materials.

9.2 ACTION LEVELS

Instrumentation will include the HNu PI-101 Photoionization Detector (PID) and/or a Century OVA 128 Flame Ionization Detector (FID). A Lumidor Gasponder Indicator (CGI) will be used to monitor for combustibles, % oxygen and hydrogen sulfide. A Geiger Counter will be used to monitor, for the possible presence of radioactivity. The action levels in this HASP will apply to all site work during the duration of activities at the Himco Dump Site. Action levels for direct-reading instruments in the Breathing Zone (BZ) are as follows:

Instrument	Action Levels	Level of Respiratory Protection/Action
HNu/OVA	Continuous readings of 0.0 to 1.0 ppm above background in BZ	Level D
HNu/OVA	Continuous readings of 1.0 to 5.0 ppm above background in BZ	Level C
HNu/OVA	Continuous readings of 5 to 500 ppm above background in BZ	Level B
HNu/OVA	Continuous readings of >500 ppm above background in BZ	Cease work and call the CHSS and HSM
Lumidor	<19.5% oxygen	Level B

Instrument	Action Levels	Level of Respiratory Protection/Action
Lumidor	>10 ppm H_2S	Level B
Lumidor	>10% LEL in borehole	Proceed with caution
Lumidor	>20% LEL in borehole	Cease work, vent, begin work only after levels safe again.
Geiger Counter	>0.01-0.02 mrem/hr	Proceed with caution call a health physicist
	>1 mrem/hr in the borehole or any site area	Cease work and call a health physicist

In the event any action levels are exceeded, work activities shall be halted. The Assistant HSO shall notify the CHSS and/or the HSM prior to any upgrade in levels of protection.

9.3 INSTRUMENT CALIBRATION

Instrument calibration shall be performed according to manufacturer's specifications and documented on the Field Instrument Calibration Log included in Appendix A of the Field Sampling Plan (Volume 2).

10.0 TRENCHING/TEST PITS

The trenching contractor will be responsible for the safe means and methods of operations associated with trenching activities. Donohue and/or team subcontractor field personnel will review the trenching contractor's health and safety plan and comply with the trenching contractor's safety procedures associated with these activities. The trenching contractor's safety procedures are to be followed during operation of heavy equipment. Donohue is responsible for all hazardous and toxic waste sampling; however, there will be no sampling during the trenching procedure.

It is anticipated that trenching activities will be carried out in Level B personal protection. Level B protection includes Level C protective clothing as described in Section 8.2 and includes SCBA or air-line respirator.

The Donohue Field Team Leader (FTL) will don Level B protection and safely position themselves near the backhoe and trench area. No one will enter the trench. All observations, logging of soils and photographs will be taken from the ground surface. Depending on conditions encountered, it may be necessary to excavate more slowly and carefully with the backhoe. Drum explosion or ruptures may pose a threat to field workers and the backhoe operator. Extreme care must be taken not to rupture any drums that may be encountered during trenching.

11.0 DECONTAMINATION PROCEDURES

The HSO and/or the Assistant HSO shall determine the level of decontamination necessary based on the evaluation of specific work activities and the potential degree of contamination. Temporary contamination reduction zones shall be established at all sampling locations.

At the end of each work day, all equipment will be transported to a fixed decontamination area for final cleaning. This area will be selected prior to start-up of RI activities.

11.1 EQUIPMENT

Drill rigs and associated equipment and vehicles will be decontaminated in the EZ at a decontamination pad. Drilling equipment (augers, rods, etc.) will be steam-cleaned between well nest locations. These decontaminations will be performed in the decon pad set up by the drillers and located in an area on the site where rinse waters can be collected and discharged to the municipal wastewater treatment system.

Non-disposable sampling equipment will be decontaminated before use, between samples, and before leaving the sampling location using procedures described in the Field Sampling Plan (Volume 2).

Equipment that cannot be immersed in soap solution and water will be wiped clean and rinsed with distilled water.

When equipment decon involves an isopropanol rinse, isopropanol rinsate will be composited from several decontamination procedures and stored for disposal in the municipal wastewater treatment system.

11.2 PERSONNEL

Personnel will perform decontamination in the Personnel CRZ upon leaving the EZ and entering the SZ or leaving the project site. Decontamination of personnel in Level D will consist of removal and disposal of coveralls (when worn) disposable boots, and gloves. Decontamination of personnel using Level C protective equipment will consist of:

- Removal and disposal of boot covers.
- Removal and disposal of coveralls.
- Removal and disposal of outer gloves.
- Removal, cleaning, and storage of respirator.

- Washing boots or other non-disposable protective equipment suspected of being contaminated using soap solution followed by potable or distilled water rinse.
- Removal and disposal of inner gloves.

Decontamination of personnel using Level B protective equipment will consist of:

- Equipment drop station
- Removal and disposal of boot covers
- Removal and disposal of outer gloves
- Removal and disposal of protective coveralls
- Cleaning or respiratory protection equipment
- Removal and disposal of inner gloves

11.3 CONTAMINATION PREVENTION

One of the most important aspects of decontamination is the prevention of contamination. Good contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel

- Know the limitations of all personal protective equipment being used.
- Do not walk through areas of obvious or known contamination.
- Do not handle or touch contaminated materials directly. Do not sit or lean on potentially contaminated surfaces.
- Make sure all Personal Protective Equipment has no cuts or tears prior to donning.
- Fasten all closures on suits, covering with tape, if necessary.
- Particular care should be taken to protect any skin injuries.
- Stay upwind of airborne contaminants.
- Do not carry cigarettes, gum, food or candy into contaminated areas.
- On-site personnel are encouraged to shower at the end of their work day.

Sampling/Monitoring

- Cover instruments with clear plastic, leaving openings for sampling ports, sensor points.
- Bag sample containers prior to emplacement of sample material.

Heavy Equipment

- Care should be taken to limit the surface area of equipment that comes into contact with contamination.

General

- If contaminated tools are to be placed on noncontaminated equipment for transport to the decon pad, plastic should be used to keep the equipment clean.
- Spoils from excavation work should be placed so as not to be in the expected paths of individuals.
- Drilling cuttings should be kept shoveled up out of the way of workers. Liquids generated during drilling should be contained out of the way to limit the amount of mud created around the rig.

11.4 DISPOSAL PROCEDURES

All discarded materials, waste materials, or other field equipment and supplies shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary and segregated for disposal. All contaminated waste materials shall be disposed of as required by the provisions included in the contract, and all appropriate regulatory provisions. All non-contaminated materials shall be collected and bagged for appropriate disposal as normal domestic waste.

12.0 GENERAL SAFE WORK PRACTICES AND COMMUNICATIONS

12.1 SAFETY EQUIPMENT

Basic emergency and first aid equipment will be available at the Support Zone and/or the CRZ, as appropriate. This shall include HASP-specified communications, first aid kit, emergency eye wash, fire extinguishers, and other safety-related equipment. Fire extinguishers will be provided, inspected, and available on-site. Other safety equipment will be located at the site of specific operations, e.g., at the drilling rig, as appropriate.

12.2 COMMUNICATIONS

Walkie-Talkies - Hand-held units shall be utilized as much as possible by field teams for communication between downrange operations and the Command Post base-station.

Telephones - A telephone will be located in the Command Post trailer in the Support Zone for communication with emergency support services/ facilities.

Hand Signals - To be employed by downrange field teams along with utilizing the buddy system. These signals are very important when working with heavy equipment. They shall be known by the entire field team before operations commence and reviewed during site-specific training.

Signal	Meaning
Hand gripping throat	Out of air; can't breathe
Grip partner's wrist	Leave area immediately; no debate
Hands on top of head	Need assistance
Thumbs up	OK; I'm all right; I understand
Thumbs down	No; negative

12.3 SAFE WORK PRACTICES

The following safe work practices will be implemented during site operations:

(1) Only properly trained and equipped personnel will be allowed to work in potentially contaminated areas.

(2) The number of personnel and equipment in the sampling areas will be kept to a minimum, consistent with safe site operations.

(3) Workers shall adhere to the "buddy system" while working downrange and in designated exclusion areas.

(4) Workers shall not exit exclusion areas until soiled equipment and clothing have been removed and decontaminated or properly disposed of.

(5) Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of potentially contaminated materials is prohibited.

(6) As necessary, personnel will thoroughly wash their hands and faces upon leaving the investigation areas.

(7) Contact with potentially contaminated materials and surfaces shall be avoided. Personnel shall comply with contamination control measures.

(8) Personnel with facial hair or other facepiece seal obstructions will not be permitted to work where respirators are required.

13.0 EMERGENCY PREPAREDNESS

13.1 EMERGENCY COORDINATOR

The Site Emergency Coordinator is:

Assistant Health and Safety Officer Dave Richardson

13.2 EMERGENCY SERVICES CONTACTS

The Emergency Coordinator (Assistant HSO) shall verify with EPA as to appropriate emergency contacts and make contact with these before beginning work on-site. The Emergency Coordinator will inform the emergency contacts about the nature and duration of work expected on the Site and the type of contaminants and possible health or safety effects of emergencies involving these contaminants. Also at this time, the Emergency Coordinator and the emergency response units shall make arrangements to handle any emergencies that might be anticipated.

EMERGENCY PHONE NUMBERS:

Police Department 911 or (219) 295-7070
Fire Department 911 or (219) 293-8931
Hospital Elkhart General Hospital 911 or (219) 294-2621
Hospital Address 600 East Boulevard, Elkhart, Indiana
National Response Center 1-800-424-8802
Poison Control Center 1-800-632-2727
CHSS/HSO Pamela B. Markelz (414) 458-8711 or (414) 457-4570
ARCS V HSM William L. Beckett (201) 460-6255
Field Team Leader Steven Spiewak (312) 902-7100 or (312) 229-0024

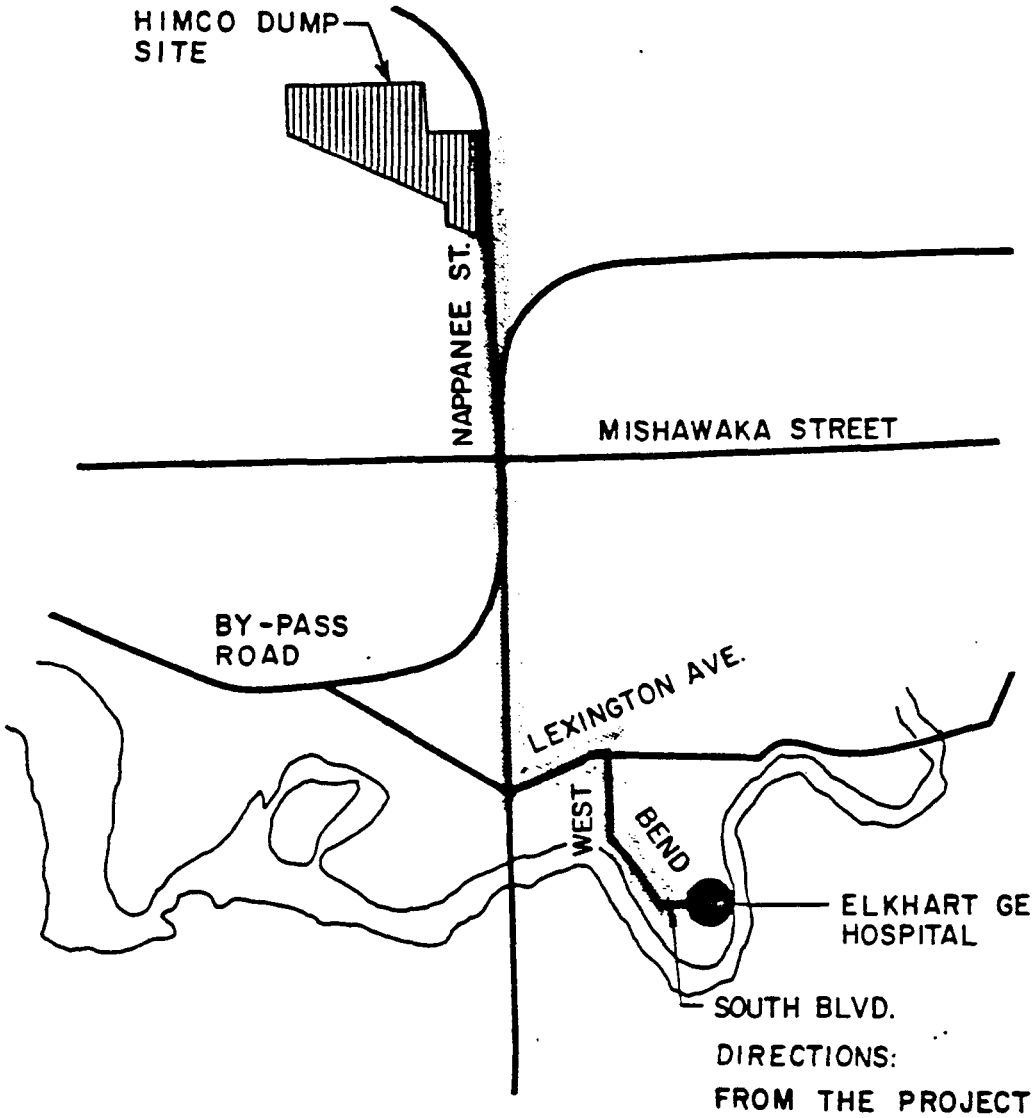
HOSPITAL ROUTE:

A hospital route map depicting the route to Elkhart General Hospital from the project site is presented in Figure 13-1.

Once the support zone is established, and before field activity start-up, the Emergency Coordinator shall drive the route to the hospital, post directions and/or a map to the hospital, and set up the first aid station, portable eye wash, and other emergency equipment.

13.3 IMPLEMENTATION

The Emergency Coordinator shall implement the emergency action procedures whenever conditions at the site warrant such action. The Emergency Coordinator will be responsible for coordinating the evacuation, emergency treatment,



DIRECTIONS:

FROM THE PROJECT SITE FOLLOW NAPPANEE ST. SOUTH TO LEXINGTON AVENUE, TURN EAST, FOLLOW TO WEST BLVD., THEN TURN SOUTH TO BEND BLVD. AND FOLLOW TO SOUTH BLVD. TURN EAST AND FOLLOW TO ELKHART GENERAL HOSPITAL, ENTRANCE AT 600 EAST BLVD.

NOT TO SCALE

Donohue

20026

FEBRUARY, 1990

Engineers • Architects • Scientists

HOSPITAL ROUTE MAP

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HIMCO DUMP SITE
ELKHART COUNTY, INDIANA

FIGURE 13-1

and emergency transport of site personnel as necessary, and for notification of emergency response units and the appropriate management staff. The following conditions may require implementation of emergency action procedures:

- Fire or explosion on-site.
- Serious personal injury.
- Combustible gases or vapors in excess of 20% lower explosive limit (LEL) in the work area.
- Release of hazardous materials, including gases or vapors at levels greater than the maximum use concentrations of respirators.
- Unsafe working conditions, such as inclement weather.

13.4 FIRE OR EXPLOSION

If concentrations of combustible gases or vapors are above 20% LEL in the borehole or Work Zone, or if an actual fire or explosion has taken place, emergency steps will include (1) evacuation of work area and (2) notification of local fire department and other appropriate emergency response groups if necessary.

13.5 PERSONAL INJURY

Emergency first aid will be administered on-site as appropriate. Then, the individual will be decontaminated if possible, depending on the severity of the injury, and transported to the nearest medical facility if needed. The Assistant HSO will supply medical data sheets to appropriate medical personnel and complete the appropriate incident report.

13.6 OVERT CHEMICAL EXPOSURE

Typical response procedures include:

SKIN CONTACT:	Use copious amounts of soap and water. Wash/rinse affected area thoroughly, then provide appropriate medical attention. Eye wash will be provided on-site at the CRZ and/or support zone as appropriate. Eyes should be rinsed for 15 minutes upon chemical contamination.
INHALATION:	Move to fresh air and/or, if necessary, decontaminate/ transport to hospital.
INGESTION:	Decontaminate and transport to emergency medical facility.
PUNCTURE WOUND OR LACERATION:	Decontaminate and transport to emergency medical facility. HSO/AHSO will provide medical data sheets to medical personnel as requested.

13.7 ADVERSE WEATHER CONDITIONS

In the event of adverse weather conditions, the HSO and/or the Assistant HSO will determine if work can continue without endangering the health and safety of field workers. Some items to be considered before determining if work should continue are:

- Potential for heat stress and heat-related injuries
- Potential for cold stress and cold-related injuries
- Treacherous weather-related working conditions
- Limited visibility
- Potential for electrical storms.

13.8 POISON IVY

If someone should come in contact with poison ivy, the individual should immediately wash the affected area with the Ivy Cleaner provided in the first aid kit. If a rash develops, it should be treated at a medical facility as soon as possible.

13.9 SNAKES AND TICKS

13.9.1 Snake Bite Prevention and First Aid

On project sampling sites, precautions against the possible presence of snakes should be taken when walking through overgrown vegetation and when moving debris (i.e. lumber, scrap metals, etc.). If someone is bitten by a snake, the procedures outlined in Appendix D should be followed.

13.9.2 Tick Bite Prevention and First Aid

Routinely check for ticks after being outdoors. Remove ticks as soon as possible before they embed. To minimize exposure, wear light-colored clothing so ticks can be detected. Tuck pants into boots or socks and wear long-sleeved shirts. Apply tick/insect repellent to clothing.

When a tick is found embedded, remove it by grasping it with a tweezers as close to the skin as possible and gently pull it straight out. Do not twist or jerk the tick because the head may remain embedded. Once the tick is removed, wash the bite area and your hands with soap and water and apply an antiseptic to the bite. Save the tick in a jar labeled with the date and the place where the tick was acquired. A physician may find this information and the tick specimen helpful in diagnosis if an infection results.

14.0 AUTHORIZATIONS AND FIELD TEAM REVIEW

14.1 AUTHORIZED PERSONNEL

Personnel authorized to enter the Himco Dump Site while field investigations are being conducted must be certified by the CHSS. Authorization will involve completion of appropriate training courses and medical examination requirements as required by OSHA 29 CFR 1910.120, and review and sign-off of this HASP. All personnel must utilize the buddy system or be escorted by appropriately trained personnel, and check in with the Field Team Leader at the Command Post.

1. Donohue Personnel Authorized to Perform Work On-site:

1.	Vanessa Harris	6.	Rob Stenson
2.	Pam Markelz	7.	Dan Gmitro
3.	Steve Spiewak	8.	Bernie Bono
4.	Dave Richardson	9.	Susan Shultz
5.	Anya Kirykowicz	10.	Joan Underwood

2. Other Personnel Authorized to Enter Site:

1. U.S. EPA-RPM
2. IDEM Staff
3. Subcontractor Personnel

14.2 FIELD TEAM REVIEW

Each field team member shall sign this section after site-specific training is completed and before being permitted to work on site.

I have read and understand this Site-Specific Health and Safety Plan. I will comply with the provisions contained therein.

Site/Project: Himco Dump RI/FS

Name Printed	/	Signature	/	Date
	/		/	
	/		/	
	/		/	
	/		/	
	/		/	
	/		/	
	/		/	
	/		/	

14.0 RECORDKEEPING

The following records and reports will be established and kept as appropriate for the Himco Dump site:

* * Accident/Incident Reports
* Air Monitoring Records
* Breathing Air Quality Documentation (from outside vendor)
* Safety Inspection Reports
* Employee Training Certificates
* * Health and Safety Audit Reports
* * Health and Safety Audit Track
* Instrumentation Calibration Logs
* Material Safety Data Sheets
* Medical Data Sheets (to be sent with injured personnel to hospital)
* * Medical Examination Reports (Physician's Written Opinion)
* Respirator Fit Test Records
* SCBA Inspection Records

* NOTE: Copies of these forms shall be forwarded to the ARCS V Project Management Office when completed.

A blank Medical Data Sheet is included as the next page of this document. A Medical Data Sheet will be completed for each person working at the site.

ARCS/P/HIMCO/AC7

MEDICAL DATA SHEET

Project Name/Location: _____

Employee Name: _____ Home Telephone: _____

Address: _____
_____
_____

Birthdate: _____ Height: _____ Weight: _____

Drug and Other Allergies: _____
_____
_____
_____
_____

Notable Medical Conditions/Medical Restrictions:
_____
_____
_____
_____
_____
_____

Do You Wear Contact Lenses? ____ Yes ____ No
Dentures? ____ Yes ____ No

Are you using any medications? ____ Yes ____ No Please list:
_____
_____
_____

Emergency Contact: _____ Relationship: _____
Address: _____ Phone: ( )_____
_____

Personal Physician: _____ Phone: ( )_____
Address: _____
_____

ARCS/P/HIMCO/AC7

APPENDIX A

CHEMICAL DATA SHEETS

HIMCO DUMP SITE

Date: 10/89

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Aluminum (Al)
   A. Synonyms:
   B. CAS #: 7429-90-5 AW:27

II. Physical Characteristics:
   A. _____ Liquid __X__ Solid _____ Powder _____ Gas
   B. Color-Tin-white, malleable, ductile metal with light blue tint
   C. Odor-
   D. LEL ____% Flash Pt. _____ °F
   E. Boiling Point _____ °F Melting Point _____ °F
      Ionization Potential
   F. Other

III. Recommended Air Purifying Cartridge:

__X__ Dusts, Fumes, Mists	_____ Acid Gases
_____ Organic Vapors	_____ Pesticides
__X__ HEPA	_____ Air Purifying is Inappropriate
_____ Ammonia/Amines	_____ Other

IV. Health Hazards Data:
   A. Routes of Entry: __X__ Inhalation ____ Skin Absorption __X__ Ingestion
   B. OSHA Listed Carcinogen: __X__ No ___ Suspect ___ Yes
   C. Sensitizer: __X__ No ___ No Data ___ Suspect ___ Yes
   D. Acute Toxicity:
      Eye Contact-Irritant
      Skin Contact-
      Inhalation- Pulmonary fibrosis when fine powder inhaled.
   E. Chronic Toxicity:
      Target Organs-
      Long-Term Effects-Evidence of Aluminosis or Aluminum pneumoconiosis.

V. Exposure Limits:
   A. OSHA PEL: 15 mg/m^3 total dust; 5 mg/m^3 Respirable dust
   B. ACGIH TLV: 10 mg/m^3 8 Hr. TWA
   C. IDLH:
   D. NIOSH REL:
   E. STEL:

VI. Other Pertinent Information/Special Precautions:

5/88

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Aluminum oxide
   A. Synonyms: alumina
   B. CAS #: 7429-90-5

II. Physical Characteristics

   A. ____ Liquid ____ Solid _X_ Powder ____ Gas
   B. Color silvery white
   C. Odor _____
   D. LEL _____ % Flash Pt. _____ °F
   E. Boiling Point _____ °F Melting Point _____ °F
      Ionization Potential _____ eV
   F. Other _____

III. Recommended Air Purifying Cartridge:

_X_ Dusts, Fumes, Mists	___ Acid Gases
___ Organic Vapors	___ Pesticides
_X_ HEPA	___ Air Purifying is Inappropriate
___ Ammonia/Amines	___ Other _____

IV. Health Hazards Data

   A. Routes of Entry: _X_ Inhalation ___ Skin Absorption
      ___ Ingestion
   B. OSHA Listed Carcinogen: _X_ No ____ Suspect ____ Yes
   C. Sensitizer: ____ No _X_ No Data ____ Suspect ____ Yes
   D. Acute Toxicity:
      Eye Contact _____
      Skin Contact _____
      Inhalation irritant (as "nuisance dust")
   E. Chronic Toxicity:
      Target Organs respiratory system
      Long-Term Effects pulmonary fibrosis (potential)

V. Exposure Limits
   A. OSHA PEL _____
   B. ACGIH TLV 10 mg/m^3 (TWA)
   C. IDLH _____
   D. NIOSH REL _____
   E. STEL 20 mg/m^3 (TWA)

VI. Other Pertinent Information/Special Precautions: _____

DATE: 3/88

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Arsenic & Compounds
   A. Synonyms: As Arsenicals
   B. CAS #: 7740-38-2

II. Physical Characteristics

   A. ___ Liquid X Solid ___ Powder ___ Gas
   B. Color vary with specific compound
   C. Odor vary with specific compound
   D. LEL _____ % Flash Pt. _____ °F
   E. Boiling Point _____ °F Melting Point _____ °F
      Ionization Potential _____ eV
   F. Other _____

III. Recommended Air Purifying Cartridge:

X Dusts, Fumes, Mists	___ Acid Gases
___ Organic Vapors	___ Pesticides
X HEPA	___ Air Purifying is Inappropriate
___ Ammonia/Amines	X Other SCBA-at any detectable concentration (NIOSH)

IV. Health Hazards Data

   A. Routes of Entry: X Inhalation X Skin Absorption
      X Ingestion
   B. OSHA Listed Carcinogen: ___ No ___ Suspect X Yes
   C. Sensitizer: ___ No ___ No Data ___ Suspect X Yes
   D. Acute Toxicity:
      Eye Contact conjunctivitis, optic nerve damage and blindness
      Skin Contact dermititis, itching, pigmentation changes, milignant changes, brittle nails and white lines on nails
      Inhalation respiratory irritant, low-grade fever, persistant headaches
      Ingestion irritation of stomach and intestines (nausea vomiting, diarrhea) and vascular damage leading to shock coma, and death
   E. Chronic Toxicity:
      Target Organs liver, kidneys, skin, lungs, lymphatics
      Long-Term Effects perforated nasal septum, cirrhosis of liver, disturbances of blood, kidney, CNS, impairment of peripheral circulation resulting in gangrene of finger and toes, anorexia, stomatitis, salivation, depression of bone marrow

CHEMICAL DATA SHEET (Cont'd)

Arsenic and Compounds

V. Exposure Limits
- A. OSHA PEL 10 ug/m3 TWA
- B. ACGIH TLV 2 ug/m3 TWA (15 min ceil)
- C. IDLH
- D. NIOSH REL
- E. STEL

VI. Other Pertinent Information/Special Precautions: toxicities, especially acute are related to their solubility in water. Therefore, soluble arsenic acids and their salts are a greater acute toxic hazard than relatively insoluble arsenic trioxide and lead arsenate

5/88

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Chromium: soluble chromic and chromous salts

A. Synonyms: dependent upon specific compound chromous

B. CAS #: 7440-47-3

II. Physical Characteristics

A. ____ Liquid __X__ Solid ____ Powder ____ Gas

B. Color Colorless - green-violet (dependent on compound)

C. Odor odorless

D. LEL _____% Flash Pt. _____°F

E. Boiling Point _____°F Melting Point _____°F
Ionization Potential _____eV

F. Other _____

III. Recommended Air Purifying Cartridge:

__X__ Dusts, Fumes, Mists
___ Organic Vapors
__X__ HEPA
___ Ammonia/Amines
___ Acid Gases
___ Pesticides
___ Air Purifying is Inappropriate
__X__ Other SCBS - at concentrations greater than 250 mg/m^3 (TWA)

IV. Health Hazards Data

A. Routes of Entry: ___ Inhalation __X__ Skin Contact
__X__ Ingestion

B. OSHA Listed Carcinogen: __X__ No ____ Suspect ____ Yes

C. Sensitizer: ____ No ____ No Data ____ Suspect __X__ Yes

D. Acute Toxicity:
Eye Contact irritant
Skin Contact dermititis
Inhalation

E. Chronic Toxicity:
Target Organs skin
Long-Term Effects irritating and corrosive effect on tissue leading to ulcers

V. Exposure Limits

A. OSHA PEL 0.5 mg/m^3 (TWA)

B. ACGIH TLV 0.05 mg/m^3

C. IDLH

D. NIOSH REL 25 ug/m^3 (10 hr TWA), 50 ug/m^3 (15 min ceiling)

E. STEL

VI. Other Pertinent Information/Special Precautions: _____

DATE 7/88

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Copper dust
   A. Synonyms:
   B. CAS #: 7440-50-8

II. Physical Characteristics

   A. ___ Liquid X Solid ___ Powder ___ Gas
   B. Color typically reddish
   C. Odor None
   D. LEL N/A % Flash Pt. N/A °F
   E. Boiling Point N/A °F Melting Point varies °F
      Ionization Potential None eV
   F. Other

III. Recommended Air Purifying Cartridge:

X Dusts, Fumes, Mists	___ Acid Gases	___ HEPA
___ Organic Vapors	___ Pesticides	___ Air Purifying is Inappropriate
___ Ammonia/Amines		___ Other ___

IV. Health Hazards Data

   A. Routes of Entry: X Inhalation ___ Skin Absorption
      X Ingestion
   B. OSHA Listed Carcinogen: X No ___ Suspect ___ Yes
   C. Sensitizer: X No ___ No Data ___ Yes
   D. Acute Toxicity:
      Eye Contact Can cause irritation, discoloration or damage.
      Skin Contact Can cause irritation or dermatitis.
      Inhalation Can cause irritation to mucous membrane, or nasal perforation, feeling of illness similar to the common cols with sensations of chill and stuffiness of the head
   E. Chronic Toxicity:
      Target Organs Respiratory system, skin, liver, kidneys
      Long Term Effects May result in skin irritation or discoloration of the skin or hair.

V. Exposure Limits
   A. OSHA PEL 1 mg/m^3
   B. ACGIH TLV 1 mg/m^3.
   C. IDLH N/A
   D. NIOSH REL N/A
   E. STEL None.

VI. Other Pertinent Information/Special Precautions:

8177b

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Lead, inorganic, as dust and fume
   A. Synonyms: Pb, solder, dross
   B. CAS #: 7439-92-1

II. Physical Characteristics

   A. ____ Liquid __X__ Solid ____ Powder ____ Gas
   B. Color Silvery to gray, depending upon oxidation
   C. Odor Varies with compound
   D. LEL Dust may be explosive% Flash Pt. NA °F
   E. Boiling Point 3164°F Melting Point 621°F
      Ionization Potential NA eV
   F. Other

III. Recommended Air Purifying Cartridge:

__X__ Dusts, Fumes, Mists	___ Acid Gases
___ Organic Vapors	___ Pesticides
__X__ HEPA	___ Air Purifying is Inappropriate
___ Ammonia/Amines	__X__ Other Higher concentrations may require supplied air

IV. Health Hazards Data

   A. Routes of Entry: __X__ Inhalation __X__ Skin Absorption __X__ Ingestion
   B. OSHA Listed Carcinogen: ___ No __X__ Suspect ___ Yes
   C. Sensitizer: ___ No __X__ No Data ___ Suspect ___ Yes
   D. Acute Toxicity:
      Eye Contact Dust is irritant
      Skin Contact Molten lead causes burns. Generally, in solid state lead causes no acute symptoms.ant and a strong
      Inhalation Lassitude, insomnia, weakness, GI disturbances, colic.
   E. Chronic Toxicity:
      Target Organs CNS, blood, GI tract, kidneys, gigival tissue
      Long-Term Effects Anorexia, weight loss, constipation, pallor, neuro-muscular motor weakness, "wrist drop". A suspect carcinogen of the lungs and kidneys. An experimental teratogen.

V. Exposure Limits
   A. OSHA PEL 0.05 mg/m^3 TWA
   B. ACGIH TLV 0.15 mg/m^3 TWA
   C. IDLH
   D. NIOSH REL Below 0.1 mg/m^3 10-hour TWA
   E. STEL

VI. Other Pertinent Information/Special Precautions:

5/88

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Manganese (dust and compounds)
   A. Synonyms: depends on specific compound
   B. CAS #: 7439-96-5

II. Physical Characteristics

A. ___ Liquid X Solid ___ Powder ___ Gas
B. Color gray
C. Odor ___
D. LEL ___ % Flash Pt. ___ °F
E. Boiling Point 3806 °F Melting Point 2273 °F
   Ionization Potential ___ eV
F. Other ___

III. Recommended Air Purifying Cartridge:

X Dusts, Fumes, Mists	___ Acid Gases
___ Organic Vapors	___ Pesticides
___ HEPA	___ Air Purifying is Inappropriate
___ Ammonia/Amines	___ Other ___

IV. Health Hazards Data

A. Routes of Entry: X Inhalation ___ Skin Absorption
   X Ingestion
B. OSHA Listed Carcinogen: X No ___ Suspect ___ Yes
C. Sensitizer: ___ No X No Data ___ Suspect ___ Yes
D. Acute Toxicity:
   Eye Contact N/A
   Skin Contact N/A
   Inhalation Malaise, fatigue, weakness in legs, dry throat, cough, tightness in chest, low-back pain, vomiting
E. Chronic Toxicity:
   Target Organs Respiratory system, CNS, Blood, kidneys
   Long-Term Effects Parkinson-like systems, metal fume fever, dyspnea, rales, symptoms simulate MS, ALS, progressive Lenticular degeneration, progressive bulbar paralysis, emotionally unstable

V. Exposure Limits
A. OSHA PEL 5 mg/m^3 (TWA)
B. ACGIH TLV 5 mg/m^3 (TWA); 1 mg/m^3 (fume)
C. IDLH 10,000 mg/m^3 (TWA)
D. NIOSH REL 5 mg/m^3 (TWA
E. STEL

VI. Other Pertinent Information/Special Precautions: ___

5/88

CHEMICAL DATA SHEET

I. Chemical/Compound Name: Nickel/Metal & Soluble Compounds
   A. Synonyms: depends on specific compound
   B. CAS #: 7440-02-0

II. Physical Characteristics

   A. ____ Liquid ____ Solid __X__ Powder ____ Gas
   B. Color silvery-gray, metalic
   C. Odor odorless
   D. LEL _____% Flash Pt. _____ °F
   E. Boiling Point _____°F Melting Point _____°F
      Ionization Potential _____eV
   F. Other ____ _____

III. Recommended Air Purifying Cartridge:

___ Dusts, Fumes, Mists	___ Acid Gases
___ Organic Vapors	___ Pesticides
___ HEPA	__X__ Air Purifying is Inappropriate
___ Ammonia/Amines	___ Other SCBA - at any detectable level

IV. Health Hazards Data

   A. Routes of Entry: __X__ Inhalation __X__ Skin Absorption __X__ Ingestion
   B. OSHA Listed Carcinogen: ____ No ____ Suspect __X__ Yes
   C. Sensitizer: ____ No ____ No Data ____ Suspect __X__ Yes
   D. Acute Toxicity:
      Eye Contact _____
      Skin Contact dermititis, allergic skin rash
      Inhalation headache, dizziness, nausea, vomiting, shortness of breath, skin tone - blue, fever, delerium
   E. Chronic Toxicity:
      Target Organs nasal cavities, lungs, skin
      Long-Term Effects pneumonitis cancer of lungs and sinuses, decreased plumonary function

V. Exposure Limits
   A. OSHA PEL 1 mg/m^3 (TWA)
   B. ACGIH TLV 1 mg/m^3 (metal), 0.1 mg/m^3 (soluble) (TWA)
   C. IDLH
   D. NIOSH REL 5ug/m^3 (10-hr TWA)
   E. STEL

VI. Other Pertinent Information/Special Precautions: _____

7688b

67-64-1

RESULT - 1 DOCUMENT

2_: ..PRIMNT 1 ALL/DOC=1

C001 ENTER COMMAND IN CORRECT FORMAT._: ..PRINT 1 ALL/DOC=1

1

AN ACCESSION NUMBER: 20. 8805.

CN CHEMICAL NAME: ACETONE.

SY SYNONYMS: 2-PROPANONE. DIMETHYL KETONE. KETONE PROPANE. METHYL KETONE. DIMETHYLFORMALDEHYDE. DIMETHYLKETAL. PYROACETIC ACID. UN 1090. PROPANONE. PYROACETIC ETHER. BETA-KETOPROPANE. KETONE, DIMETHYL. 1B-KETOPROPANE.

RN CAS NUMBER: 67-64-1.

REG. TOXIC NUMBER: AL3150000.

CHEMICAL FORMULA: C3H6O.

PD

PHYSICAL DESCRIPTION:

COLORLESS VOLATILE LIQUID WITH A PUNGENT ODOR, SWEETISH TASTE.

MOL WT:	58.08
BOILING PT:	133 F
SOLUBILITY:	SOLUBLE
FLASH PT:	-4 F
VAPOR PRES:	184 MMHG AT 20C
MELT PT:	-140 F
UEL IN AIR:	13
LEL IN AIR:	2.5
MEC IN AIR:	869 F
SPEC GRAVITY:	0.7899
VAPOR DENSITY:	2.0
ODOR THRESHOLD:	2.0 PPM
OCTANOL/WATER CO-EFFICIENT:	-0.24.

EL

PERMISSABLE EXPOSURE:

1000 PPM OSHA TWA

250 PPM NIOSH RECOMMENDED TWA

750 PPM ACGIH TWA

1000 PPM ACGIH STEL

MUTAGENIC DATA (RTEC)

REPRODUCTIVE EFFECTS DATA (RTEC)

CERCLA HAZARD RATINGS - TOXICITY 1 - IGNITABILITY 3 - REACTIVITY 0 - PERSISTENCE 0

AQUATIC TOXICITY RATING 0 (TLM96 >1000 PPM)

TLM96 - LEPOMIS MACROCHIRUS 8,300 PPM, GAMBUSIA AFINIS 13,000 PPM

TLM48 - RASBORA HETEROMORPHA 4,000 PPM, DAPHNIA MAGNA 10 PPM

LC, 1H - LEPOMIS HUMILIS 14,350-15,050 PPM

THRESHOLD CONCN, 32H - DAPHNIA MAGNA 9,280 PPM

TOXICOLOGY: ACETONE IS AN EYE, SKIN AND MUCOUS MEMBRANE IRRITANT AND A CENTRAL NERVOUS SYSTEM DEPRESSANT. POISONING MAY RESULT IN HYPERGLYCEMIA, AND LIVER AND KIDNEY DAMAGE. PROLONGED EXPOSURE TO VAPORS MAY CAUSE CORNEAL OPACITY OR RESULT IN ACETONE IN THE BLOOD.

ANIMAL STUDIES SHOW ADVERSE EFFECTS ON FERTILITY WHEN FEMALES ARE EXPOSED CHRONICALLY DURING PREGNANCY.

THE THRESHOLD LIMIT VALUE WAS SET TO PREVENT IRRITATION.

ALCOHOL MAY ENHANCE THE TOXIC EFFECTS.

PERSONS WITH CHRONIC RESPIRATORY OR SKIN DISEASES MAY BE AT INCREASED RISK FROM EXPOSURE.

EAF LIFE: 5800 MG/KG ORL-MUS LD50: 3000 MG/KG

SKN-RBT LD50: 20 GM/KG IPR-MUS LD50: 127 MG/KG
IHL-RAT LC50: 16000 PPM/4 H IHL-MUS LCLO: 110000 MG/M3/60 MIN
ORL-DOG LDLO: 24 GM/KG UNK-MAN LDLO: 1159 MG/KG
SCU-DOG LDLO: 5 GM/KG SCU-GPG LDLO: 5000 MG/KG
ORL-MAN TDLO: 2857 MG/KG IHL-HMN TCLO: 500 PPM
IHL-MAN TCLO: 12000 PPM/4H IHL-MAN TCLO: 440 UG/M3/6 MIN
IHL-MAN TCLO: 10 MG/M3/6H

SKIN AND EYE IRRITATION DATA
SKN-RBT 395 MG OPEN MLD EYE-HMN 500 PPM
EYE-RBT 3950 UG SEV

OSHA STANDARD 29CFR1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS HAVING WORKPLACES IN THE MANUFACTURING DIVISION, STANDARD INDUSTRIAL CLASSIFICATION CODES 20 THROUGH 39, TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF HAZARD COMMUNICATION PROGRAM INCLUDING LABELS, MATERIAL SAFETY DATA SHEETS, TRAINING, AND ACCESS TO WRITTEN RECORDS 48FR53280 11/25/83 FOLLOWING OSHA STANDARDS APPLICABLE TO SUBSTANCES LISTED 29CFR1910, OTHERWISE ADVISE.

DANGEROUS EXPOSURE:
20,000 PPM OSHA/NIOSH
COLORLESS VOLATILE LIQUID WITH.

IC
INCOMPATIBILITIES:
ACIDS. OXIDIZERS. NITRIC ACID. SULFURIC ACID. STRONG BASES. PLASTICS. STRONG OXIDIZERS. NITRATES. REDUCING AGENTS. ALDEHYDES. NITRIC ACID + HYDROGEN PEROXIDE. AMINES. WATER. DUST/VAPORS MAY FORM EXPLOSIVE MIXTURE WITH AIR.

CL
CLOTHING:
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING WET WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE CLEANING OPERATION OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.
-ACGIH 'GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING'- INDICATES THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MAY VARY FOR MIXTURES.)
ACETONE EXCELLENT/GOOD BUTYL RUBBER GOOD/FAIR POLYETHYLENE CHLORINATED POLYURETHANE STYRENE-BUTADIENE RUBBER FAIR/GOOD
NEOPRENE/STYRENE-BUTADIENE RUBBER NITRILE/POLYVINYL CHLORIDE POLYURETHANE FAIR/POOR NATURAL RUBBER NEOPRENE NEOPRENE/NATURAL RUBBER NITRILE RUBBER POLYVINYL ALCOHOL POLYVINYL CHLORIDE VITON.

WEAR EYE PROTECTION TO PREVENT:
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THIS LIQUID MAY CONTACT THE EYES.

EMPLOYEE SHOULD WASH:
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES WET WITH THIS SUBSTANCE PROMPTLY WASH OR SHOWER TO REMOVE ANY CONTAMINANT FROM THE SKIN.

WORK CLOTHING SHOULD BE CHANGED DAILY:
NOT REQUIRED

C_3H_6O 2

REMOVE CLOTHING:
EMPLOYERS SHALL ENSURE THAT ANY CLOTHING WHICH BECOMES WET WITH THIS FLAMMABLE LIQUID BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
NONE REQUIRED.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
1000 PPM
- CHEMICAL CARTRIDGE RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE
- POWERED AIR-PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDG
- SUPPLIED-AIR RESPIRATOR
- SELF-CONTAINED BREATHING APPARATUS

6250 PPM
- SUPPLIED-AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE

12,500 PPM
- (FRONTOR BACK-MOUNTED) GAS MASK WITH AN ORGANIC VAPOR CANISTER
~~SUPPLIED-AIR RESPIRATOR~~
WITH A FULL FACE-PIECE
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE

20,000 PPM
- SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE

ESCAPE
~~- (FRONTOR BACK-MOUNTED) GAS MASK WITH AN ORGANIC VAPOR CANISTER~~
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

~~FIREFIGHTING~~
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MS

MEDICAL SURVEILLANCE:
GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEAR 48FR38187 08/22/83 48FR39225 08/30/83 (EFFECTIVE DATE CORRECTION).
RESPIRATORY HISTORY.
PRE-PLACEMENT AND ANNUAL EXAMS.
BLOOD CHEMISTRY.
GLUCOSE DETERMINATION.
COMPLETE BLOOD COUNT.
14 BY 17 CHEST P.A. X-RAY.
URINALYSIS.
VISION TEST.
EKG RECOMMENDED IF EMPLOYEE TO WEAR FULL-FACE RESPIRATOR.
PULMONARY FUNCTIONS.
RESPIRATORY HISTORY.
CENTRAL NERVOUS SYSTEM TESTS, PERIPHERAL NEUROPATHY.
PHYSICIAN EXAMINATION INDUSTRIAL EXPOSURE HISTORY.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.

RE

ROUTE OF ENTRY:
INHALATION. SKIN ABSORPTION. INGESTION. SKIN OR EYE CONTACT.

TO

TARGET ORGANS:
EYES. SKIN. RESPIRATORY SYSTEM. MUCOUS MEMBRANES. CENTRAL NERVOUS SYSTEM

SYMPTOMS:
RESPIRATORY, PERTAINING TO THE LUNGS (SC0142);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). SOMNOLENCE, PROLONGED SLEEPINESS (SC0152). DIZZINESS, FEELING FAINT, LIGHT-HEADED, UNSTEADY(SC0048). INSOMNIA, INABILITY TO OBTAIN NORMAL SLEEP (SC0088). INCOORDINATION, LACK OF COORDINATION (SC0085). NARCOSIS, STUPOR OR SLEEP DUE TO NARCOTIC (SC0113). VOMITING, PERTAINING TO NAUSEA (SC016 HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). CONFUSION, IN A BEWILDERED STATE (SC0030). LASSITUDE, A SENSE OF WEARINESS (SC0098). WEAKNESS, LACK OF STRENGTH (SC0167).
LOWERED, REDUCED OR DROPPED (SC0278);
APPETITE, A DESIRE TO TAKE FOOD (SC0103). UNCONSCIOUSNESS, NOT AWAKE; INSENSIBLE (SC0198). BLOOD CHANGES, CHANGES IN BLOOD CELLS OR MORPHOLOGY (SC0227).
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). ERYTHEMA, REDNESS, SPOTS ON SKIN (SC0060).
SKIN, COVERING OF BODY (SC0174);
DEFATTING, LOSS OF FAT/LIPIDS (SC0039).
FIBRILLATION, SPONTANEOUS RAPID MUSCLE CONTRACTIONS(SC0065);
~~DAMAGE, PERMANENT INJURY (SC0287).~~
CORNEAL, TRANSPARENT MEMBRANE OVER EYE (SC0035);
OPACITY, LACK OF TRANSPARENCY (SC0121). SLEEP DISORDERS, CHANGE IN ~~NORMAL SLEEP PATTERNS (SC0599).~~ ~~HEMATEMESIS, BLOODY VOMITUS (SC0273).~~ HYPERGLYCEMIA, ABNORMALLY HIGH BLOOD SUGAR (SC0389). COLLAPSE, EXTREM PROSTRATION (SC0029). COMA, STATE OF DEEP UNCONSCIOUSNESS (SC0583). ~~LIVER DAMAGE, INJURY TO THE LIVER (SC0221).~~ ~~KIDNEY DAMAGE, INJURY TO THE KIDNEY (SC0220).~~ CONVULSIONS, SUDDEN MUSCLE CONTRACTIONS (SC0034) COUGHING, FORCEFUL EXPIRATION (SC0173). GASTRITIS, STOMACH INFLAMMATI ~~(SC0548). HEMATEMESIS, BLOODY VOMITUS (SC0273).~~ ANXIETY, A TROUBLED-FEELING (SC0009). RHINORRHEA, WATERY NASAL DISCHARGE (SC0382). STUPO LETHARGY, UNCONSCIOUSNESS (SC0214). UNCONSCIOUSNESS, NOT AWAKE; ~~INSENSIBLE (SC0198).~~

FA
FIRST AID.

(1 OF 6)
IF THIS CHEMICAL GETS INTO THE EYES, IMMEDIATELY WASH THE EYES WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING THE LOWER AND UPPER LIDS. GET MEDICAL ATTENTION IMMEDIATELY. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.

(2 OF 6)
IF THIS CHEMICAL GETS ON THE SKIN, IMMEDIATELY WASH CONTAMINATED SKIN WITH SOAP OR MILD DETERGENT & WATER. IF THIS CHEMICAL SOAKS CLOTHING, IMMEDIATELY REMOVE CLOTHING & WASH SKIN WITH SOAP OR MILD DETERGENT & WATER. GET MEDICAL ATTENTION PROMPTLY.

(3 OF 6)
ALDEHYDE/KETONE/ETHER/ESTER INHALATION: EMERGENCY TREATMENT - REMOVE FROM EXPOSURE. MAINTAIN AIRWAY AND RESPIRATION. GIVE OXYGEN BY INHALATION. FURTHER TREATMENT - TREAT PULMONARY EDEMA. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

(4 OF 6)
PULMONARY EDEMA - RELIEVE ANXIETY. GIVE MORPHINE SULFATE, 10 MG, TO DECREASE RATE OF RAPID, INEFFICIENT RESPIRATION. GIVE 40% OXYGEN BY FACE MASK. USE INTERMITTENT POSITIVE-PRESSURE OXYGEN RESUSCITATOR FOR SHORT PERIODS. GIVE AMINOPHYLLINE, 0.5 G, INTRAVENOUSLY, TO RELIEVE ASSOCIATED BRONCHIAL CONSTRICTION. TREAT EDEMA CAUSED BY MORPHINE OR MORPHINE ANALOGS BY GIVING NALOXONE AND OXYGEN. (MEDICATION MUST BE GIVEN BY QUALIFIED MEDICAL PERSONNEL) (DREISBACH, HANDBOOK OF POISONIN 11TH ED.).

C_3H_6O 4

(5 OF 6)

IMMEDIATELY GIVE PERSON LARGE QUANTITIES OF WATER. AFTER WATER HAS BEEN SWALLOWED, TRY TO GET THE PERSON TO VOMIT BY HAVING HIM TOUCH THE BACK OF HIS THROAT WITH HIS FINGER. DO NOT MAKE AN UNCONSCIOUS PERSON VOMIT GET MEDICAL ATTENTION IMMEDIATELY.

(6 OF 6)

ALDEHYDE/KETONE/ETHER/ESTER INGESTION: EMERGENCY TREATMENT - REMOVE BY GASTRIC LAVAGE OR EMESIS. GIVE ACTIVATED CHARCOAL. FOR METALDEHYDE, GASTRIC LAVAGE WITH 2-5% SODIUM BICARBONATE SOLUTION WILL REDUCE CONVERSION TO ACETALDEHYDE. FOLLOW WITH SALINE CATHARSIS. GASTRIC LAVAGE AND CATHARSIS ARE EFFECTIVE UP TO 12-24 HOURS AFTER POISONING. MAINTAIN AIRWAY AND RESPIRATION. GIVE OXYGEN IF RESPIRATION IS DEPRESSED. ANTIDOTE - IN METALDEHYDE POISONING WITH UNCONTROLLABLE CONVULSIONS, CAUTIOUS TRIAL OF D-PENICILLAMINE, N-ACETYLCYSTEINE, ASCORBIC ACID, OR THIAMINE HAS BEEN SUGGESTED. CAUTIOUS TRIAL OF NALOXONE HAS ALSO BEEN SUGGESTED. (ANTIDOTES MUST BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL) FURTHER TREATMENT - TREAT COMA, HYPOXIA, PULMONARY EDEMA, AND METHEMOGLOBINEMIA. GIVE GLUCOSE INTRAVENOUSLY FOR HYPOGLYCEMIA. TREAT CONVULSIONS WITH DIAZEPAM, 0.1 MG/KG SLOWLY INTRAVENOUSLY. DO NOT USE PARALDEHYDE. BARBITUATES AND ANTICONVULSANT SUCH AS PHENYTOIN SHOULD NOT BE GIVEN. TREAT RENAL AND HEPATIC FAILURE IN METALDEHYDE POISONING, MAINTAIN ALKALINE URINE AND TREAT ACIDOSIS BY ADMINISTRATION OF SODIUM BICARBONATE OR OTHER ALKALINIZING AGENTS. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

DT

SPECIAL DIAGNOSTIC TESTS AND INDEXES OF EXPOSURE:
IF SYMPTOMS OF CENTRAL NERVOUS SYSTEM OCCUR, OBTAIN BLOOD GLUCOSE AND RECTAL TEMPERATURE. PERFO

ENTER DOCUMENT SELECTION.:

END OF DOCUMENTS IN LIST.:

BRS SEARCH MODE - ENTER QUERY
2.:

C_3H_6O 5

..PRINT 1 ALL/DOC=1

1

AN ACCESSION NUMBER: 766. 8805.
CN CHEMICAL NAME: DICHLORODIFLUOROMETHANE.
SY SYNONYMS: REFRIGERANT 12. FREON 12. PROPELLANT 12. HALON. UCON 122 ISOTRON 12. LEDON 12. UN 1028. METHANE, DICHLORODIFLUORO-. ALGOFREN TYPE 2. ARCTON 6. DIFLUORODICHLOROMETHANE. ELECTRO-CF 12. F 12. FC 1 FLUOROCARBON-12. ESKIMON 12. FREON F-12. FRIGEN 12. GENETRON 12.
RN CAS NUMBER: 75-71-8.

REG. TOXIC NUMBER: PA8200000.

CHEMICAL FORMULA: CCL2F2.

PD
PHYSICAL DESCRIPTION:
COLORLESS, PRACTICALLY ODORLESS, NONCORROSIVE GAS. FAINT, ETHER-LIKE ODOR IN HIGH CONCENTRATIONS.

MOL WT:	121
BOILING PT:	-22 F
SOLUBILITY:	0.008 G
FLASH PT:	NONFLAMMABLE
VAPOR PRES:	5.78 ATM @ 21.1 C
MELT PT:	-252 F
UEL IN AIR:	NOT COMBUSTIBLE
LEL IN AIR:	NOT COMBUSTIBLE
MEC IN AIR:	
SPEC GRAVITY:	1.1834
VAPOR DENSITY:	4.2
ODOR THRESHOLD:	
OCTANOL/WATER CO-EFFICIENT:	

EL
PERMISSABLE EXPOSURE:
1000 PPM OSHA TWA
1000 PPM (4950 MG/M3) ACGIH TWA
AQUATIC TOXICITY RATING 0 (TLM96 >1000 PPM)
NO DATA LOCATED - RATED BY THE NATIONAL ACADEMY OF SCIENCES
CERCLA HAZARD RATINGS - TOXICITY 1 - IGNITABILITY 0 - REACTIVITY 0 - PERSISTENCE 2
TOXICOLOGY: DICHLORODIFLUOROMETHANE IS A CENTRAL NERVOUS SYSTEM DEPRESSANT.
SYMPTOMS OF NARCOSIS FROM OVEREXPOSURE ARE PARESTHESIAS, TINNITUS, SLURRED SPEECH, APPREHENSION, AND CARDIAC ARRHYTHMIAS.
THE THRESHOLD LIMIT VALUE IS BASED ON AN ATTAINABLE VALUE RATHER THAN A HAZARD LIMIT.
IHL-HMN TCLO:200000 PPM/30 MIN
IHL-RAT LC50: 80 PPH/30 MIN
IHL-MUS LC50: 76 PPH/30 MIN
IHL-RBT LC50: 80 PPH/30 MIN
IHL-GPG LC50: 80 PPH/30 MIN

OSHA STANDARD 29CFR1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS HAVING WORKPLACES IN THE MANUFACTURING DIVISION, STANDARD INDUSTRIAL CLASSIFICATION CODES 20 THROUGH 39, TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF HAZARD COMMUNICATION PROGRAM INCLUDING LABELS, MATERIAL SAFETY DATA SHEETS, TRAINING, AND ACCESS TO WRITTEN RECORDS 48FR53280 11/25/83 FOLLOWING OSHA STANDARDS APPLICABLE TO

DANGEROUS EXPOSURE:
50,000 PPM OSHA/NIOSH
COLORLESS, PRACTICALLY ODORLES.

IC

INCOMPATIBILITIES:
ACTIVE METALS. SODIUM. POTASSIUM. CALCIUM. MAGNESIUM.

CL

CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA 'OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS':
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT THE SKIN FROM BECOMING FROZEN FROM CONTACT WITH THIS LIQUID OR FROM CONTACT WITH VESSELS CONTAINING THIS LIQUID.
-ACGIH 'GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING' INDICATES THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MA VARY FOR MIXTURES.)
FREON 12: EXCELLENT/GOOD: NEOPRENE GOOD/FAIR: VITON FAIR/GOOD: BUTYL RUBBER NITRILE RUBBER POLYVINYL CHLORIDE FAIR/POOR: NATURAL RUBBER.

WEAR EYE PROTECTION TO PREVENT:
FOLLOWING INFORMATION FROM NIOSH/OSHA 'OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS':
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THIS LIQUID MAY CONTACT THE EYES.

EMPLOYEE SHOULD WASH:
NOT APPLICABLE.

WORK CLOTHING SHOULD BE CHANGED DAILY:
NOT REQUIRED.

REMOVE CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA 'OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS':
EMPLOYERS SHALL ENSURE THAT ANY CLOTHING WHICH BECOMES WET WITH THIS FLAMMABLE LIQUID BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
NONE REQUIRED.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
10,000 PPM
- SUPPLIED-AIR RESPIRATOR
- SELF-CONTAINED BREATHING APPARATUS

25,000 PPM
- SUPPLIED-AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE

50,000 PPM
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE
- SUPPLIED-AIR RESPIRATOR
WITH A FULL FACE-PIECE

ESCAPE
- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

CCL2F2 2

- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

ME

MEDICAL SURVEILLANCE:
GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEAR 48FR38187 08/22/83 48FR39225 08/30/83 (EFFECTIVE DATE CORRECTION).
CARDIOVASCULAR DISEASE.
PULMONARY FUNCTIONS.
RESPIRATORY HISTORY.
BLOOD CHEMISTRY.
COMPLETE BLOOD COUNT.
14 BY 17 CHEST P.A. X-RAY.
PHYSICIAN EXAMINATION INDUSTRIAL EXPOSURE HISTORY.
PERIODIC EXAM FOLLOWING EXPOSURE.

RE

ROUTE OF ENTRY:
INHALATION.

TO

TARGET ORGANS:
CENTRAL NERVOUS SYSTEM. CARDIOVASCULAR SYSTEM.

SP

SYMPTOMS:
FROSTBITE, FREEZING OF TISSUE (SC0068). NARCOSIS, STUPOR OR SLEEP DUE TO NARCOTIC (SC0113). ANESTHESIA, LOSS OF SENSATION (SC0005). CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028); DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). PARESTHESIA, ABNORMAL SENSATION WITHOU CAUSE (SC0125). TINNITUS, RINGING IN EARS (SC0308). APPREHENSION, FEELING OF UNEASINESS, FEAR, ANXIETY (SC0073). APHASIA, LOSS OF VERBAI COMPREHENSION (SC0415). DIZZINESS, FEELING FAINT, LIGHT-HEADED, UNSTEADY(SC0048). DROWSINESS, FALLING ASLEEP (SC0049). DISORIENTATIO INABILITY TO SENSE DIRECTION OR TIME (SC0169). INCOORDINATION, LACK O COORDINATION (SC0085). NAUSEA, SICKNESS AT THE STOMACH (SC0115). VOMITING, PERTAINING TO NAUSEA (SC0166). UNCONSCIOUSNESS, NOT AWAKE; INSENSIBLE (SC0198). ASPHYXIA, SUFFOCATION (SC0011). CARDIAC, PERTAINING TO HEART (SC0023); ARRHYTHMIA, ABSENCE OF RHYTHM; IRREGULARITY (SC0010). CARDIAC, PERTAINING TO HEART (SC0023); FAILURE, LOSS OF FUNCTION (SC0386).

FA

FIRST AID.

(1 OF 1)
FLUOROCARBON EXPOSURE: DEATH OCCURS SO RAPIDLY THAT NO TREATMENT IS POSSIBLE. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

DT

SPECIAL DIAGNOSTIC TESTS AND INDEXES OF EXPOSURE:
IF SYMPTOMS OF CENTRAL NERVOUS SYSTEM OCCUR, OBTAIN BLOOD GLUCOSE AND RECTAL TEMPERATURE. PERFORM COM
ENTER DOCUMENT SELECTION.:

END OF DOCUMENTS IN LIST.:

BRS SEARCH MODE - ENTER QUERY
2.: 593-70-4

593-70-4 SEARCH TERM NOT FOUND

RESULT 0 DOCUMENTS
3.: ..OFF

78-93-3

RESULT 1 DOCUMENT
5_: ..PRINT 4 ALL/DOC=1

1
AN ACCESSION NUMBER: 1601. 8805.
CN CHEMICAL NAME: METHYL ETHYL KETONE.
SY SYNONYMS: 2-BUTANONE. KETONE, ETHYL METHYL. ACETONE, METHYL-. MEK.
BUTANONE. BUTANONE-2. METHYL ACETONE. ETHYL METHYL KETONE. MEETCO.
RN CAS NUMBER: 78-93-3.

REG. TOXIC NUMBER: EL6475000.

CHEMICAL FORMULA: C4H8O.
PD
PHYSICAL DESCRIPTION:
CLEAR, COLORLESS LIQUID, ACETONE-LIKE ODOR.

MOL WT:	72.12
BOILING PT:	175 F
SOLUBILITY:	27%
FLASH PT:	21 F
VAPOR PRES:	70 MM
MELT PT:	-123 F
UEL IN AIR:	11.4 @ 200 F
LEL IN AIR:	1.7 @ 200 F
MEC IN AIR:	759 F
SPEC GRAVITY:	0.8054
VAPOR DENSITY:	2.5
ODOR THRESHOLD:	5 PPM
OCTANOL/WATER CO-EFFICIENT:	0.26.

EL
PERMISSABLE EXPOSURE:
200 PPM OSHA TWA
200 PPM ACGIH TWA
300 PPM ACGIH STEL
200 PPM NIOSH RECOMMENDED 10 HOUR TWA
TERATOGENIC DATA (RTEC)
AQUATIC TOXICITY RATING 0 (TLM96:>1000 PPM)
TLM96 - GAMBUSIA AFFINIS 5600 PPM
TLM48 - BLUEGILL SUNFISH 5640 PPM
CERCLA HAZARD RATINGS - TOXICITY 2 - IGNITABILITY 3 - REACTIVITY 0 -
PERSISTENCE 0
TOXICOLOGY: MEK IS A MILD EYE AND MUCOUS MEMBRANE IRRITANT, PRIMARY
SKIN IRRITANT, AND CENTRAL NERVOUS SYSTEM DEPRESSANT.
ACUTE EXPOSURE IRRITATES THE EYES, SKIN, AND RESPIRATORY TRACT.
DIRECT CONTACT CAUSES PAINFUL IRRITATION AND CORNEAL INJURY. REPEATED
OR
PROLONGED SKIN CONTACT MAY LEAD TO DERMATITIS.
AT HIGH CONCENTRATIONS, MEK ACTS AS A NARCOTIC. PERIPHERAL NEUROPATHY
MAY ALSO OCCUR.
THE IRRITANT AND ODOR PROPERTIES ARE CONSIDERED ADEQUATE WARNING
PROPERTIES.
THE THRESHOLD LIMIT VALUE WAS ADOPTED TO PREVENT INJURIOUS EFFECTS ANI
MINIMIZE ODOR AND IRRITATION COMPLAINTS.
IHL-HMN TCLO: 100 PPM/5 MIN
IHL-RAT LCLO:2000 PPM/4 HR
ORL-RAT LD50:2737 MG/KG
SKN-RBT LD50: 13 GM/KG

OSHA STANDARD 29CFR1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL

[illegible] THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS HAVING WORKPLACES IN THE MANUFACTURING DIVISION, STANDARD INDUSTRIAL CLASSIFICATION CODES 20 THROUGH 39, TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF HAZARD COMMUNICATION PROGRAM INCLUDING LABELS, MATERIAL SAFETY DATA SHEETS, TRAINING, AND ACCESS TO WRITTEN RECORDS 48FR53280 11/25/83 FOLLOWING OSHA STANDARDS APPLICABLE TO SUBSTANCES LISTED 29CFR1910, OTHERWISE ADVISE.

DANGEROUS EXPOSURE:
3000 PPM NIOSH/OSHA
CLEAR, COLORLESS LIQUID, ACETO.

IC

INCOMPATIBILITIES:
STRONG OXIDIZERS. NITRATES. NITRIC ACID. REDUCING AGENTS. ALDEHYDES NITRIC ACID + HYDROGEN PEROXIDE.

CL

CLOTHING:
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING WET WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE CLEANING OPERATION OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.
-ACGIH 'GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING' INDICATES THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MAY VARY FOR MIXTURES.)
METHYL ETHYL KETONE: EXCELLENT/GOOD: BUTYL RUBBER FAIR/GOOD: NEOPRENE/STYRENE-BUTADIENE RUBBER NITRILE/POLYVINYL CHLORIDE CHLORINATE POLYETHYLENE POLYURETHANE STYRENE-BUTADIENE RUBBER FAIR/POOR: NATURAL RUBBER NEOPRENE NEOPRENE/NATURAL RUBBER NITRILE RUBBER POLYETHYLENE POLYVINYL ALCOHOL POLYVINYL CHLORIDE VITON.

WEAR EYE PROTECTION TO PREVENT:
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THIS LIQUID MAY CONTACT THE EYES.

EMPLOYEE SHOULD WASH:
NOT APPLICABLE.

WORK CLOTHING SHOULD BE CHANGED DAILY:
NOT REQUIRED.

REMOVE CLOTHING:
EMPLOYERS SHALL ENSURE THAT ANY CLOTHING WHICH BECOMES WET WITH THIS FLAMMABLE LIQUID BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED THIS SUBSTANCE, EMPLOYERS SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

RP

C_4H_8O

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
1000 PPM
- POWERED AIR-PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRID(
- CHEMICAL CARTRIDGE RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE

3000 PPM
- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- SUPPLIED-AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE
- SUPPLIED-AIR RESPIRATOR
WITH A FULL FACE-PIECE

ESCAPE
- GAS MASK WITH AN ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONTOR BACK-MOUNTED CANISTER)
- APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MS
MEDICAL SURVEILLANCE:
EKG RECOMMENDED IF EMPLOYEE TO WEAR FULL-FACE RESPIRATOR.
GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEAR 48FR38187 08/22/83 48FR39225 08/30/83 (EFFECTIVE DATE CORRECTION).
PHYSICIAN EXAMINATION INDUSTRIAL EXPOSURE HISTORY.
PRE-PLACEMENT AND ANNUAL EXAMS.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.
RESPIRATORY HISTORY.
CHRONIC RESPIRATORY DISEASE.
SKIN EXAM.
NOTICE OF INTENT TO ESTABLISH: ACGIH BIOLOGICAL EXPOSURE INDICES FOR METHYL ETHYL KETONE: 2 MG/L METHYL ETHYL KETONE IN URINE / TIMING -END OF SHIFT.

RE
ROUTE OF ENTRY:
INHALATION. INGESTION. SKIN ABSORPTION. SKIN OR EYE CONTACT.

TO
TARGET ORGANS:
EYES. RESPIRATORY SYSTEM. SKIN. CENTRAL NERVOUS SYSTEM. PERIPHERAL NERVOUS SYSTEM. GASTROINTESTINAL.

SP
SYMPTOMS:
MUCOUS MEMBRANE, MEMBRANE LINING PASSAGES/CAVITIES (SC0109);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
NASAL, PERTAINING TO THE NOSE (SC0114);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). CONJUNCTIVITIS, INFLAMMATION OF EYES (SC0031). HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). DIZZINESS, FEELING FAINT, LIGHT-HEADED, UNSTEADY(SC0048). DROWSINESS, FALLING ASLEEP (SC0049). CONFUSION, IN A BEWILDERED STATE (SC0030). VOMITING, PERTAINING TO NAUSEA (SC0166). NARCOSIS, STUPOR (SLEEP DUE TO NARCOTIC (SC0113).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028);
DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043). PERIPHERAL NEUROPATHY, NERVE DISORDER OF EXTREMITIES (SC0128).
NUMBNESS, COMBINED ANESTHESIA AND PARESTHESIA (SC0120);
EXTREMITIES, ARMS OR LEGS (SC0062). DERMATITIS, INFLAMMATION OF SKIN (SC0044).
REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281);
IN EXPERIMENTAL ANIMALS, (SC0212). NAUSEA, SICKNESS AT THE STOMACH (SC0115).

Cc-20

INJURY, DAMAGE OR HURT SUFFERED (SCOOB7).

FA

FIRST AID.

(1 OF 5)
IF THIS CHEMICAL GETS INTO THE EYES, IMMEDIATELY WASH THE EYES WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING THE LOWER AND UPPER LIDS. GET MEDICAL ATTENTION IMMEDIATELY. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.

(2 OF 5)
IF THIS CHEMICAL GETS ON THE SKIN, IMMEDIATELY WASH CONTAMINATED SKIN WITH SOAP OR MILD DETERGENT & WATER. IF THIS CHEMICAL SOAKS CLOTHING, IMMEDIATELY REMOVE CLOTHING & WASH SKIN WITH SOAP OR MILD DETERGENT & WATER. GET MEDICAL ATTENTION PROMPTLY.

(3 OF 5)
ALDEHYDE/KETONE/ETHER/ESTER INHALATION: EMERGENCY TREATMENT - REMOVE FROM EXPOSURE. MAINTAIN AIRWAY AND RESPIRATION. GIVE OXYGEN BY INHALATION. FURTHER TREATMENT - TREAT PULMONARY EDEMA. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

(4 OF 5)
PULMONARY EDEMA - RELIEVE ANXIETY. GIVE MORPHINE SULFATE, 10 MG, TO DECREASE RATE OF RAPID, INEFFICIENT RESPIRATION. GIVE 40% OXYGEN BY FACE MASK. USE INTERMITTENT POSITIVE-PRESSURE OXYGEN RESUSCITATOR FOR SHORT PERIODS. GIVE AMINOPHYLLINE, 0.5 G, INTRAVENOUSLY, TO RELIEVE ASSOCIATED BRONCHIAL CONSTRICTION. TREAT EDEMA CAUSED BY MORPHINE OR MORPHINE ANALOGS BY GIVING NALOXONE AND OXYGEN. (MEDICATION MUST BE GIVEN BY QUALIFIED MEDICAL PERSONNEL) (DREISBACH, HANDBOOK OF POISONIN(11TH ED.).

(5 OF 5)
ALDEHYDE/KETONE/ETHER/ESTER INGESTION: EMERGENCY TREATMENT - REMOVE BY GASTRIC LAVAGE OR EMESIS. GIVE ACTIVATED CHARCOAL. FOR METALDEHYDE, GASTRIC LAVAGE WITH 2-5% SODIUM BICARBONATE SOLUTION WILL REDUCE CONVERSION TO ACETALDEHYDE. FOLLOW WITH SALINE CATHARSIS. GASTRIC LAVAGE AND CATHARSIS ARE EFFECTIVE UP TO 12-24 HOURS AFTER POISONING. MAINTAIN AIRWAY AND RESPIRATION. GIVE OXYGEN IF RESPIRATION IS DEPRESSED. ANTIDOTE - IN METALDEHYDE POISONING WITH UNCONTROLLABLE CONVULSIONS, CAUTIOUS TRIAL OF D-PENICILLAMINE, N-ACETYLCYSTEINE, ASCORBIC ACID, OR THIAMINE HAS BEEN SUGGESTED. CAUTIOUS TRIAL OF NALOXONE HAS ALSO BEEN SUGGESTED. (ANTIDOTES MUST BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL) FURTHER TREATMENT - TREAT COMA, HYPOXIA, PULMONARY EDEMA, AND METHEMOGLOBINEMIA. GIVE GLUCOSE INTRAVENOUSLY FO HYPOGLYCEMIA. TREAT CONVULSIONS WITH DIAZEPAM, 0.1 MG/KG SLOWLY INTRAVENOUSLY. DO NOT USE PARALDEHYDE. BARBITUATES AND ANTICONVULSAN SUCH AS PHENYTOIN SHOULD NOT BE GIVEN. TREAT RENAL AND HEPATIC FAILUR IN METALDEHYDE POISONING, MAINTAIN ALKALINE URINE AND TREAT ACIDOSIS B ADMINISTRATION OF SODIUM BICARBONATE OR OTHER ALKALINIZING AGENTS. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

DT

SPECIAL DIAGNOSTIC TESTS AND INDEXES OF EXPOSURE:
IF SYMPTOMS OF CENTRAL NERVOUS SYSTEM OCCUR, OBTAIN BLOOD GLUCOSE AND RECTAL TEMPERATURE. PERFO

ENTER DOCUMENT SELECTION.:

END OF DOCUMENTS IN LIST.:

BRS SEARCH MODE - ENTER QUERY
5.:

108-39-4

RESULT 3 DOCUMENTS
4_: ..PRINT 3 ALLDOC=1

D003 RE-ENTER PARAGRAPH SELECTION...INVALID CODE WAS ALLDOC=1_: ..PRINT 3
=1

D007 NUMERIC PARAGRAPH SELECTION IS INVALID. PLEASE ENTER PARAGRAPH LABEL

4_: ..PRINT 3 ALL/DOC=3

3
AN ACCESSION NUMBER: 1969. 8805.
CN CHEMICAL NAME: P-CRESOL.
SY SYNONYMS: 4-CRESOL. P-CRESYLIC ACID. 1-HYDROXY-4-METHYLBENZENE.
P-HYDROXYTOLUENE. 1-METHYL-4-HYDROXYBENZENE. PARAMETHYL PHENOL.
PARA-CRESOL. UN 2076. 4-HYDROXYTOLUENE. P-KRESOL.
P-METHYLHYDROXYBENZENE. P-METHYLPHENOL. 4-METHYLPHENOL. P-OXYTOLUENE
PHENOL, 4-METHYL-. P-TOLUOL. P-TOLYL ALCOHOL.
RN CAS NUMBER: 106-44-5.

REG TOXIC NUMBER: GO6475000.

CHEMICAL FORMULA: C7H8O.
PD
PHYSICAL DESCRIPTION:
CRYSTALS, PHENOLIC ODOR.

MOL WT:	108.15
BOILING PT:	395 F
SOLUBILITY:	INSOLUBLE
FLASH PT:	202 F
VAPOR PRES:	1 MM @ 97 F
MELT PT:	95 F
UEL IN AIR:	N/A
LEL IN AIR:	1.1%
MEC IN AIR:	1038 F
SPEC GRAVITY:	1.0178
VAPOR DENSITY:	3.72
ODOR THRESHOLD:	5 PPM
OCTANOL/WATER CO-EFFICIENT:	1.92-1.94.

EL
PERMISSABLE EXPOSURE:
5 PPM OSHA TWA (SKIN NOTATION)
5 PPM ACGIH TWA (SKIN NOTATION)
10 MG/M3 NIOSH RECOMMENDED TWA
ANIMAL CARCINOGEN (RTEC)
CERCLA HAZARD RATINGS - TOXICITY 3 - IGNITABILITY 1 - REACTIVITY 0 -
PERSISTENCE 2
AQUATIC TOXICITY RATING 3/T (TLM96 1 - 10 PPM)
TLM96 - GAMBUSIA AFFINIS 22 PPM; RAINBOW TROUT 7.4 PPM
TOXICOLOGY: SEE CRESOL.
ORL-RAT LD50:207 MG/KG
ORL-MUS LD50:344 MG/KG
ORL-RBT LDLO:620 MG/KG
SKN-RBT LD50:301 MG/KG

OSHA STANDARD 29CFR1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL
MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH
THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS HAVING WORKPLACES IN THE

THROUGH 39, TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF HAZARD COMMUNICATION PROGRAM INCLUDING LABELS, MATERIAL SAFETY DATA SHEETS, TRAINING, AND ACCESS TO WRITTEN RECORDS 48FR53280 11/25/83 FOLLOWING OSHA STANDARDS APPLICABLE TO SUBSTANCES LISTED 29CFR1910, OTHERWISE ADVISE.

DANGEROUS EXPOSURE:
250 PPM OSHA/NIOSH
CRYSTALS, PHENOLIC ODOR.

IC

INCOMPATIBILITIES:
STRONG OXIDIZERS. STRONG ALKALIES. STRONG ACIDS. NITRIC ACID. ACTIVE METALS.

CL

CLOTHING:
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT ANY POSSIBLITY OF SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING WET WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES FOR THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS TO BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE CLEANING OPERATION OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.
-ACGIH 'GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING' INDICATES THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH TIME MAY VARY FOR MIXTURES.)
CRESOLS: EXCELLENT/GOOD: NONE INDICATED GOOD/FAIR: NATURAL RUBBER NEOPRENE CHLORINATED POLYETHYLENE SARANEX FAIR/GOOD: BUTYL RUBBER NITRILE RUBBER POLYVINYL CHLORIDE.

WEAR EYE PROTECTION TO PREVENT:
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE SPLASH-PROOF GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THERE IS ANY POSSIBILITY OF THIS LIQUID CONTACTING THE EYES.

EMPLOYEE SHOULD WASH:
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE IMMEDIATELY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHO HANDLE THIS SUBSTANCE WASH THEIR HANDS THOROUGHLY WITH SOAP OR MILD DETERGENT AND WATER BEFORE EATING, SMOKING, OR USING TOILET FACILITIES.

WORK CLOTHING SHOULD BE CHANGED DAILY:
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE CLOTHING HAS HAD ANY POSSIBILITY OF BEING CONTAMINATED WITH THIS SUBSTANCE CHANGE INTO UNCONTAMINATED CLOTHING BEFORE LEAVING THE WORK PREMISES.

REMOVE CLOTHING:
EMPLOYERS SHALL ENSURE THAT NON-IMPERVIOUS CLOTHING WHICH BECOMES CONTAMINATED WITH THIS SUBSTANCE BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

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THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, EMPLOYERS SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.
WHERE THERE IS ANY POSSIBILITY OF EXPOSURE OF AN EMPLOYEE'S BODY TO THIS SUBSTANCE, EMPLOYERS SHALL PROVIDE FACILITIES FOR QUICK DRENCHING OF THE BODY WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
50 PPM
- CHEMICAL CARTRIDGE RESPIRATOR
WITH AN ORGANIC VAPOR CARTRIDGE
OPERATED IN PRESSURE-DEMAND, POSITIVE-PRESSURE, OR CONTINUOUS-FLO
MODE
WITH A DUST AND MIST FILTER
- SELF-CONTAINED BREATHING APPARATUS
- SUPPLIED-AIR RESPIRATOR

250 PPM
- CHEMICAL CARTRIDGE RESPIRATOR
WITH AN ORGANIC VAPOR CARTRIDGE
WITH A FULL FACE-PIECE
WITH A DUST AND MIST FILTER
- SUPPLIED-AIR RESPIRATOR
WITH A FULL FACE-PIECE, HELMENT, OR HOOD
- SELF-CONTAINED BREATHING APPARATUS
WITH A FULL FACE-PIECE

ESCAPE
- GAS MASK
WITH AN ORGANIC VAPOR CANISTER
PROVIDING PROTECTION AGAINST ACID GASES

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS
WITH A FULL FACE-PIECE
OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MS
MEDICAL SURVEILLANCE:
EKG RECOMMENDED IF EMPLOYEE TO WEAR FULL-FACE RESPIRATOR.
GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES
CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC
SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS
AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP
RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEAR
48FR38187 08/22/83 48FR39225 08/30/83 (EFFECTIVE DATE CORRECTION).
PHYSICIAN EXAMINATION INDUSTRIAL EXPOSURE HISTORY.
PRE-PLACEMENT AND ANNUAL EXAMS.
MEDICAL WARNING FOR REFUSAL OF MEDICAL EXAMINATION.
RESPIRATORY HISTORY.
PULMONARY FUNCTIONS.
14 BY 17 CHEST P.A. X-RAY.
BLOOD CHEMISTRY.
RENAL AND LIVER FUNCTIONS.
COMPLETE BLOOD COUNT.
VISION TEST.
CENTRAL NERVOUS SYSTEM TESTS, PERIPHERAL NEUROPATHY.
SKIN EXAM.

RE
ROUTE OF ENTRY:
INHALATION. SKIN ABSORPTION. SKIN OR EYE CONTACT.

TO
TARGET ORGANS:
CENTRAL NERVOUS SYSTEM. RESPIRATORY SYSTEM. LIVER. KIDNEYS. SKIN.

SF
SYMPTOMS:
NEOPLASM; ABNORMAL TISSUE FORMATION (SC0272).
NASAL, OLFACTORY ORGAN (SC0171);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
SKIN, COVERING OF BODY (SC0174);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). VOMITING,
PERTAINING TO NAUSEA (SC0166). COLLAPSE, EXTREME PROSTRATION (SC0029)
RESPIRATORY, PERTAINING TO THE LUNGS (SC0142);

C_7H_{8O}

EDEMA, FLUID RETENTION WITH SWELLING (SC0181). NAUSEA, SICKNESS AT THE STOMACH (SC0115). RESPIRATORY DISTRESS, DIFFICULTY BREATHING (SC0219). CYANOSIS, DARK BLUE/PURPLE SKIN COLOR (SC0038). SWEATING, EXCRETING MOISTURE THROUGH THE SKIN (SC0156). THIRST, DESIRE FOR WATER (SC0210). CONVULSIONS, SUDDEN MUSCLE CONTRACTIONS (SC0034). DIARRHEA, UNCONTROLLED LOOSE BOWELS (SC0046). LIVER DAMAGE, INJURY TO THE LIVER (SC0221). KIDNEY DAMAGE, INJURY TO THE KIDNEY (SC0220). DERMATITIS, INFLAMMATION OF SKIN (SC0044).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028); DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043).

FA

FIRST AID.

(1 OF 9)
IF THIS CHEMICAL GETS INTO THE EYES, IMMEDIATELY WASH THE EYES WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING THE LOWER AND UPPER LIDS. GET MEDICAL ATTENTION IMMEDIATELY. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.

(2 OF 9)
IF THIS CHEMICAL GETS ON THE SKIN, IMMEDIATELY WASH CONTAMINATED SKIN WITH SOAP OR MILD DETERGENT & WATER. IF THIS CHEMICAL SOAKS CLOTHING, IMMEDIATELY REMOVE CLOTHING & WASH SKIN WITH SOAP OR MILD DETERGENT & WATER. GET MEDICAL ATTENTION PROMPTLY.

(3 OF 9)
IF THIS CHEMICAL GETS ON SKIN, IMMEDIATELY FLUSH CONTAMINATED SKIN WITH WATER. IF THIS CHEMICAL PENETRATES CLOTHING, IMMEDIATELY REMOVE THE CLOTHING AND FLUSH THE SKIN WITH WATER. GET MEDICAL ATTENTION PROMPTLY

(4 OF 9)
WHEN THIS CHEMICAL HAS BEEN SWALLOWED, IMMEDIATELY GET MEDICAL ATTENTIC IF MEDICAL ATTENTION IS NOT IMMEDIATELY AVAILABLE, GET THE AFFECTED PERSON TO VOMIT BY HAVING HIM TOUCH THE BACK OF HIS THROAT WITH HIS FINGER OR BY GIVING HIM SYRUP OF IPECAC AS DIRECTED ON PACKAGE. THIS NON-PRESCRIPTION DRUG SHOULD BE KEPT WITH EMERGENCY MEDICAL SUPPLIES IN THE WORKPLACE AND IS AVAILABLE AT MOST DRUG COUNTERS. DO NOT MAKE AN UNCONSCIOUS PERSON VOMIT.

(5 OF 9)
IF THIS PHENOLIC COMPOUND IS SWALLOWED, IMMEDIATELY ADMINISTER ACTIVATI CHARCOAL AT A DOSAGE 5 TO 10 TIMES THE ESTIMATED WEIGHT OF THE SUBSTAN INGESTED OR AT LEAST 30 GRAMS OF ACTIVATED CHARCOAL DISSOLVED IN WATER DILUTE STOMACH CONTENTS WITH WATER OR MILK. CASTOR OIL (30 TO 60 ML) MAY BE ADMINISTERED TO REDUCE ABSORPTION OF CHEMICAL.

(6 OF 9)
SYRUP OF IPECAC - GIVE 15 ML (ONE TABLESPOON) OF SYRUP OF IPECAC FOLLOWED BY ONE-HALF GLASS OF WATER. IF EMESIS DOES NOT OCCUR IN THIR MINUTES, REPEAT WITH SAME DOSE. IF PATIENT MUST BE MOVED, KEEP IN HEAD-DOWN POSITION TO FACILITATE EMESIS AND PREVENT ASPIRATION OF VOMITUS. IF EMESIS DOES NOT OCCUR AFTER SYRUP OF IPECAC IS GIVEN, PERFORM GASTRIC LAVAGE TO PREVENT EMETINE POISONING. SAVE SPECIMENS O EMESIS FOR ANALYSIS. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

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(7 OF 9)
METHEMOGLOBINEMIA - GIVE 100% OXYGEN BY MASK IF PATIENT SHOWS SIGNS OF DYSPNEA OR AIR HUNGER. REMOVE POISON BY GASTRIC LAVAGE OR EMESIS FOLLOWED BY CATHARSIS. WASH SKIN THOROUGHLY WITH SOAP AND WATER. GIV METHYLENE BLUE, 1% SOLUTION, 0.1 ML/KG INTRAVENOUSLY OVER A 10 MINUTE PERIOD. ADMINISTRATION OF METHYLENE BLUE MAY CAUSE HYPERTENSION, NAUSEA, AND DIZZINESS. LARGER DOSES (>500 MG) WILL CAUSE VOMITING, DIARRHEA, CHEST PAIN, MENTAL CONFUSION, CYANOSIS, AND SWEATING. HEMOLYTIC ANEMIA HAS OCCURED SEVERAL DAYS AFTER ADMINISTRATION. IF METHYLENE BLUE IS NOT AVAILABLE, GIVE ASCORBIC ACID, 1 G SLOWLY

INTRAVENOUSLY. (ANTIDOTE MUST BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL) (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

(8 OF 9)
LIVER DAMAGE - REMOVE FROM EXPOSURE TO ALL CHEMICALS AND DRUGS. MAINTAIN COMPLETE BED REST. AVOID ANESTHESIA OR SURGICAL PROCEDURES. AVOID DEHYDRATION OR OVERHYDRATION. IF VOMITING SEVERE AND ORAL FLUIDS NOT RETAINED, REPLACE VOMITUS WITH AN EQUAL QUANTITY OF 100% DEXTROSE I NORMAL SALINE. IN RENAL FUNCTION ADEQUATE, GIVE 1 LITER OF 5% DEXTROSE OR INVERT SUGAR IN NORMAL SALINE PLUS 1-3 LITERS OF 10% DEXTROSE OR INVERT SUGAR IN DISTILLED WATER INTRAVENOUSLY EVERY TWENTY-FOUR HOURS. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

(9 OF 9)
ACUTE RENAL FAILURE - TREAT SHOCK. FOR HEMOLYTIC REACTIONS, GIVE SODIU BICARBONATE, 5 G EVERY 1-2 HOURS AS NECESSARY TO MAINTAIN AN ALKALINE URINE. (MEDICATION MUST BE GIVEN BE QUALIFIED MEDICAL PERSONNEL). (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

DT
SPECIAL DIAGNOSTIC TESTS AND INDEXES OF EXPOSURE:
LIVER PROFILE BLOOD TESTS.
COMPLETE BLOD COUNT.

RS
REGULATORY STATUS.

ENTER DOCUMENT SELECTION._:

END OF DOCUMENTS IN LIST_:

BRS SEARCH MODE -- ENTER QUERY
4_:

C7H80

RESULT 1 DOCUMENT
3.: ..PRINT 2 ALL/DOC=1

1
AN ACCESSION NUMBER: 2055. 8805.
CN CHEMICAL NAME: PHENOL.
SY SYNONYMS: CARBOLIC ACID. MONOHYDROXYBENZENE. NCI-C50124. PHENYLHYDROXIDE. UN 1671. BAKER'S P AND S LIQUID AND OINTMENT. HYDROXYBENZENE. OXYBENZENE. PHENIC ACID. PHENYL HYDRATE. PHENYL HYDROXIDE. PHENYLIC ACID. PHENYLIC ALCOHOL. IZAL. PHENYL ALCOHOL.
RN CAS NUMBER: 108-95-2.

REG. TOXIC NUMBER: SJ3325000.

CHEMICAL FORMULA: C6H6O.
PD
PHYSICAL DESCRIPTION:
WHITE, CRYSTALLINE MASS WHICH TURNS PINK OR RED IF NOT PERFECTLY PURE OR IF UNDER THE INFLUENCE OF LIGHT; DISTINCTIVE ODOR; SHARP BURNING TASTE. WHEN IN VERY WEAK SOLUTION IT HAS A SWEETISH TASTE.

MOL WT:	94
BOILING PT:	359 F
SOLUBILITY:	8.4%
FLASH PT:	175F
VAPOR PRES:	0.36 MM
MELT PT:	109 F
UEL IN AIR:	8.6%
LEL IN AIR:	1.8%
MEC IN AIR:	1319 F
SPEC GRAVITY:	1.0576
VAPOR DENSITY:	3.2
ODOR THRESHOLD:	0.05 PPM
OCTANOL/WATER CO-EFFICIENT:	1.46.

EL
PERMISSABLE EXPOSURE:
5 PPM OSHA TWA (SKIN NOTATION); 5 PPM ACGIH TWA (SKIN NOTATION)
20 MG/M3 NIOSH RECOMMENDED TWA;60 MG/M3 NIOSH RECOMMENDED 15 MIN CEILI
NEGATIVE CARCINOGEN IN RATS/MICE (NCI, TR 203)
TERATOGENIC DATA (RTEC); MUTAGENIC DATA (RTEC)
AQUATIC TOXICITY RATING 2/T (TLM96 10 - 100 PPM)
TLM96 - FINGERLING CHANNEL CATFISH 16.7 PPM, BLUEGILL 23.88 PPM, FATHEAD 32 PPM, GUPPY 39.19 PPM, GAMBUSIA AFFINIS 56 PPM
TLM48 - SALMO GAIRDNERII 9.3 PPM, PINK SHRIMP 17.5 PPM, BROWN SHRIMP 23.5 PPM, COCKLE 500 PPM, FLOUNDER 33-100 PPM, SHORE CRAB 56 PPM, RASBORA HETEROMORPHA 6.8 PPM, DAPHNIA MAGNA 16 PPM
CERCLA HAZARD RATINGS - TOXICITY 3 - IGNITABILITY 2 - REACTIVITY 0 - PERSISTENCE 1
TOXICOLOGY: PHENOL IS AN EYE AND MUCOUS MEMBRANE IRRITANT, PRIMARY SKI IRRITANT, AND CONVULSANT.
ACUTE POISONING CAUSES EYE IRRITATION, DIZZINESS, HEADACHE, DELIRIUM, SWEATING, AND BREATHING DIFFICULTY. OTHER SIGNS ARE THIRST, NAUSEA AN VOMITING, DIARRHEA, CYANOSIS AND EXCITEMENT. SEVERE POISONING PRODUCE MUSCULAR WEAKNESS, STUPOR, HYPOTENSION, HEMOLYSIS, CONVULSIONS, COMA, AND PULMONARY EDEMA. DEATH MAY OCCUR IMMEDIATELY FROM RESPIRATORY FAILURE, OR LATER FROM LIVER DAMAGE OR ANURIA. INHALATION IS UNLIKELY DUE TO THE LOW VAPOR PRESSURE OF PHENOL.
CHRONIC EXPOSURE CREATES SYMPTOMS SIMILAR TO THAT OF ACUTE POISONING.

FEELING. SKIN SENSITIVITY REACTIONS HAVE OCCASIONALLY OCCURRED. EYE CONTACT CAUSES SEVERE CORNEAL INJURY.
THE THRESHOLD LIMIT VALUE WAS SET TO PREVENT SYSTEMIC POISONING IF SKIN ABSORPTION IS AVOIDED.
ORL-HMN LDLO:140 MG/KG
ORL-RAT LD50:414 MG/KG
ORL-MUS LD50:300 MG/KG
IHL-RAT LC50:316 MG/M3
IHL-MUS LC50:177 MG/M3
IHL-MAM LC50: 74 MG/M3
SKN-RAT LD50:669 MG/KG
SKN-RBT LD50:850 MG/KG

OSHA STANDARD 29CFR1910.1200 HAZARD COMMUNICATION REQUIRES CHEMICAL MANUFACTURERS AND IMPORTERS TO ASSESS THE HAZARDS OF CHEMICALS WHICH THEY PRODUCE OR IMPORT, AND ALL EMPLOYERS HAVING WORKPLACES IN THE MANUFACTURING DIVISION, STANDARD INDUSTRIAL CLASSIFICATION CODES 20 THROUGH 39, TO PROVIDE INFORMATION TO THEIR EMPLOYEES CONCERNING HAZARDOUS CHEMICALS BY MEANS OF HAZARD COMMUNICATION PROGRAM INCLUDING LABELS, MATERIAL SAFETY DATA SHEETS, TRAINING, AND ACCESS TO WRITTEN RECORDS 48FR53280 11/25/83 FOLLOWING OSHA STANDARDS APPLICABLE TO SUBSTANCES LISTED 29CFR1910, OTHERWISE ADVISE.

DANGEROUS EXPOSURE:
100 PPM OSHA/NIOSH
WHITE, CRYSTALLINE MASS WHICH.

IC
INCOMPATIBILITIES:
STRONG OXIDIZERS. CALCIUM HYPOCHLORITE.

CL
CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA 'OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS':
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT NECESSARY TO PREVENT ANY POSSIBLITY (SKIN CONTACT WITH THIS SUBSTANCE. FACE SHIELDS SHALL COMPLY WITH 29CFR1910.133(A)(2), (A)(4), (A)(5), AND (A)(6).
EMPLOYERS SHALL ENSURE THAT CLOTHING WHICH HAS HAD ANY POSSIBILITY OF BEING CONTAMINATED WITH THIS SUBSTANCE IS PLACED IN CLOSED CONTAINERS FOR STORAGE UNTIL IT CAN BE DISCARDED OR UNTIL THE EMPLOYER PROVIDES F(THE REMOVAL OF THE CONTAMINANT FROM THE CLOTHING. IF THE CLOTHING IS T(BE LAUNDERED OR OTHERWISE CLEANED TO REMOVE THE CONTAMINANT, THE EMPLOYER SHALL INFORM THE PERSON PERFORMING THE OPERATION OF THE HAZARDOUS PROPERTIES OF THE SUBSTANCE.
-ACGIH 'GUIDELINES FOR THE SELECTION OF CHEMICAL PROTECTIVE CLOTHING' INDICATES THE FOLLOWING PROTECTIVE RATINGS FOR MATERIALS COMMONLY USED FOR PROTECTIVE CLOTHING. THESE RATINGS ARE BASED PRIMARILY ON QUANTITATIVE TEST RESULTS AND QUALITATIVE RESISTANCE INFORMATION. (THE RECOMMENDATIONS APPLY TO THE PURE SUBSTANCE ONLY; BREAKTHROUGH-TIME MA VARY FOR MIXTURES.)
PHENOL: EXCELLENT/GOOD: BUTYL RUBBER NEOPRENE GOOD/FAIR: NATURAL RUBBE NEOPRENE/NATURAL RUBBER POLYETHYLENE CHLORINATED POLYETHYLENE FAIR/GOO NITRILE/POLYVINYL CHLORIDE POLYURETHANE STYRENE-BUTADIENE RUBBER VITON FAIR/POOR: NITRILE POLYVINYL ALCOHOL POLYVINYL CHLORIDE PHENOL, <30% EXCELLENT/GOOD: NONE INDICATED GOOD/FAIR: POLYETHYLENE CHLORINATED POLYETHYLENE POLYVINYL CHLORIDE.

WEAR EYE PROTECTION TO PREVENT:
FOLLOWING INFORMATION FROM NIOSH/OSHA 'OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS':
EMPLOYERS SHALL PROVIDE AND ENSURE THAT EMPLOYEES USE DUST-RESISTANT SAFETY GOGGLES WHICH COMPLY WITH 29CFR1910.133(A)(2)-(A)(6) WHERE THER IS ANY POSSIBILTY OF THIS SOLID CONTACTING THE EYES.

C6460 2

EMPLOYEE SHOULD WASH:

FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE SKIN BECOMES CONTAMINATED WITH THIS SUBSTANCE IMMEDIATELY WASH OR SHOWER WITH SOAP OR MILD DETERGENT AND WATER TO REMOVE ANY CONTAMINANT FROM THE SKIN.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHO HANDLE THIS SUBSTANCE WASH THEIR HANDS THOROUGHLY WITH SOAP OR MILD DETERGENT AND WATER BEFORE EATING, SMOKING, OR USING TOILET FACILITIES.

WORK CLOTHING SHOULD BE CHANGED DAILY:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT EMPLOYEES WHOSE CLOTHING HAS HAD ANY POSSIBILITY OF BEING CONTAMINATED WITH THIS SUBSTANCE CHANGE INTO UNCONTAMINATED CLOTHING BEFORE LEAVING THE WORK PREMISES.

REMOVE CLOTHING:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
EMPLOYERS SHALL ENSURE THAT NON-IMPERVIOUS CLOTHING WHICH BECOMES CONTAMINATED WITH THIS SUBSTANCE BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.
EMPLOYERS SHALL ENSURE THAT ANY CLOTHING WHICH BECOMES WET WITH THIS FLAMMABLE LIQUID BE REMOVED IMMEDIATELY AND NOT REWORN UNTIL THE SUBSTANCE IS REMOVED FROM THE CLOTHING.

THE FOLLOWING EQUIPMENT SHOULD BE AVAILABLE:
FOLLOWING INFORMATION FROM NIOSH/OSHA "OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS":
WHERE THERE IS ANY POSSIBILITY OF EXPOSURE OF AN EMPLOYEE'S BODY TO TH SUBSTANCE, EMPLOYERS SHALL PROVIDE FACILITIES FOR QUICK DRENCHING OF TI BODY WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.
WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED THIS SUBSTANCE, EMPLOYERS SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN TH IMMEDIATE WORK AREA FOR EMERGENCY USE.
EMPLOYERS SHALL ENSURE THAT EMPLOYEES DO NOT EAT OR SMOKE IN AREAS WHE THIS SUBSTANCE IS HANDLED, PROCESSED OR STORED.

RP

RESPIRATOR SELECTION (UPPER LIMIT DEVICES PERMITTED):
50 PPM
- CHEMICAL CARTRIDGE RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE WITH A DUST AND MIST FILTER
- SUPPLIED-AIR RESPIRATOR
- SELF-CONTAINED BREATHING APPARATUS

125 PPM
- SUPPLIED-AIR RESPIRATOR OPERATED IN CONTINUOUS FLOW MODE
- POWERED AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE AND DUST AND MIST FILTER

250 PPM
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE
- SUPPLIED-AIR RESPIRATOR WITH A FULL FACE-PIECE
- CHEMICAL CARTRIDGE RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE WITH A HIGH-EFFICIENCY PARTICULATE FILTER AND WITH A FULL FACE-PIECE
- AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONTOR BACK-MOUNTED ORGANIC VAPOR CANISTER HAVING A HIG EFFICIENCY PARTICULATE FILTER
- POWERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACEPIEC AND ORGANIC VAPOR CARTRIDGE AND HIGH-EFFICIENCY PARTICULATE FILTER

ESCAPE
- AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONTOR BACK-MOUNTED ORGANIC VAPOR CANISTER HAVING A HIG EFFICIENCY PARTICULATE FILTER

CC460

APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS

FIREFIGHTING
- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE-PIECE OPERATED IN PRESSURE-DEMAND OR POSITIVE-PRESSURE MODE.

MS
MEDICAL SURVEILLANCE:
GENERAL MEDICAL HISTORY.
40CFR717 RECORDS AND REPORTS OF ALLEGATIONS THAT CHEMICAL SUBSTANCES CAUSE SIGNIFICANT ADVERSE REACTIONS TO HEALTH OR THE ENVIRONMENT TOXIC SUBSTANCES CONTROL ACT (TSCA) SECTION 8(C) RULE REQUIRES MANUFACTURERS AND CERTAIN PROCESSORS OF CHEMICAL SUBSTANCES AND MIXTURES TO KEEP RECORDS OF SIGNIFICANT ADVERSE REACTIONS TO EMPLOYEE HEALTH FOR 30 YEAR 48FR38187 08/22/83 48FR39225 08/30/83 (EFFECTIVE DATE CORRECTION).
RESPIRATORY HISTORY.
PRE-PLACEMENT AND ANNUAL EXAMS.
BLOOD CHEMISTRY.
RENAL AND LIVER FUNCTIONS.
COMPLETE BLOOD COUNT.
14 BY 17 CHEST P.A. X-RAY.
URINALYSIS.
VISION TEST.
ELECTROCARDIOGRAM.
PULMONARY FUNCTIONS.
ACGIH BIOLOGICAL EXPOSURE INDICES FOR PHENOL: 250 MG/G CREAT. OR 15 MG/H TOTAL PHENOL IN URINE / TIMING -END OF SHIFT.

RE
ROUTE OF ENTRY:
SKIN ABSORPTION. INGESTION. SKIN OR EYE CONTACT. INHALATION.

TO
TARGET ORGANS:
EYES. SKIN. RESPIRATORY SYSTEM. BLOOD. CENTRAL NERVOUS SYSTEM. CARDIOVASCULAR SYSTEM. GASTROINTESTINAL. KIDNEYS. LIVER.

SP
SYMPTOMS:
EYE, ORGAN OF SIGHT (SC0170);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090).
NASAL, OLFACTORY ORGAN (SC0171);
IRRITATION, EXTREME REACTION TO A CONDITION (SC0090). PHARYNGITIS, INFLAMED PHARYNX (SORE THROAT) (SC0265). THIRST, DESIRE FOR WATER (SC0210). SWEATING, EXCRETING MOISTURE THROUGH THE SKIN (SC0156). DIARRHEA, UNCONTROLLED LOOSE BOWELS (SC0046). WEAKNESS, LACK OF STRENGTH (SC0167). METHEMOGLOBINEMIA, BLOOD CONDITION FOLLOWING SOME POSION(SC0230). CYANOSIS, DARK BLUE/PURPLE SKIN COLOR (SC0038). EXCITATION, CENTRAL NERVOUS SYSTEM STIMULATION (SC0289). SKIN BURNS, INJURY OF SKIN CAUSED BY HEAT (SC0176). STUPOR, LETHARGY, UNCONSCIOUSNESS (SC0214). NAUSEA, SICKNESS AT THE STOMACH (SC0115). VOMITING, PERTAINING TO NAUSEA (SC0166). HYPOTENSION, LOW BLOOD PRESSURE (SC0180).
CENTRAL NERVOUS SYSTEM, PERTAINING TO NEURAL BODY SYSTEM (SC0028);
DEPRESSION, DECREASE IN ACTIVITY/FUNCTION (SC0043). PANCREATITIS, INFLAMMATION OF THE PANCREAS (SC0390).
SPLEEN, SUBSTERNAL ORGAN; BLOOD FILTER (SC0258);
DAMAGE, PERMANENT INJURY (SC0287). KIDNEY DAMAGE, INJURY TO THE KIDNE (SC0220). LIVER DAMAGE, INJURY TO THE LIVER (SC0221).
RESPIRATORY, PERTAINING TO THE LUNGS (SC0142);
FAILURE, LOSS OF FUNCTION (SC0386). SHOCK, SUDDEN PHYSICAL OR MENTAL DISTURBANCE(SC0228). COLLAPSE, EXTREME PROSTRATION (SC0029). COMATOS STATE OF DEEP UNCONSCIOUSNESS (SC0186). CONVULSIONS, SUDDEN MUSCLE CONTRACTIONS (SC0034).
ABDOMINAL, RELATING TO THE ABDOMEN (SC0001);
PAIN, SUFFERING, EITHER PHYSICAL OR MENTAL (SC0182). CONJUNCTIVITIS, INFLAMMATION OF EYES (SC0031). HEMOLYSIS, BLOOD DISSOLUTION, DESTRUCTION (SC0195).
RESPIRATORY, PERTAINING TO THE LUNGS (SC0142);
EDEMA, FLUID RETENTION WITH SWELLING (SC0181). PNEUMONIA, ACUTE

C4/60

(SC0092). OLIGURIA, DECREASED URINATION (SC0323). ANURIA, COMPLETE LACK OF URINATION (SC0304). HEMATURIA, RED BLOOD CELLS IN URINE (SC0076). PROTEINURIA, PROTEIN IN URINE, OFTEN ALBUMIN (SC0140). ACIDOSIS, ACID IMBALANCE (SC0290). ALKALOSIS, INCREASE OF BODY ALKALINITY (SC0436). GANGRENE, ANEMIC NECROSIS OF TISSUE (SC0229). ANOREXIA, DIMINISHED APPETITE (SC0006). WEIGHT LOSS, DROP IN BODY WEIGHT (SC0104). OCHRONOSIS, DARK PIGMENTATION (SC0250). CACHEXIA, IL HEALTH, MALNUTRITION, WASTING (SC0021).
CORNEAL, TRANSPARENT MEMBRANE OVER EYE (SC0035);
DAMAGE, PERMANENT INJURY (SC0287). TREMORS, TREMBLING, SHAKING (SC0197 HEADACHE, PAIN IN HEAD OR CRANIUM AREA (SC0075). EUPHORIA, AN EXAGGERATED FEELING OF WELL-BEING (SC0061). TINNITUS, RINGING IN EARS (SC0308). VERTIGO, FEELING OF WHIRLING MOTION (SC0163). TACHYCARDIA, ABNORMAL RAPID HEARTBEAT (SC0158).
REPRODUCTIVE EFFECTS, BIRTH DEFECTS (SC0281);
IN EXPERIMENTAL ANIMALS, (SC0212).

FA

FIRST AID.

(1 OF 9)
IF THIS CHEMICAL GETS INTO THE EYES, IMMEDIATELY WASH THE EYES WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING THE LOWER AND UPPER LIDS. GET MEDICAL ATTENTION IMMEDIATELY. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.

(2 OF 9)
IF THIS CHEMICAL GETS ON THE SKIN, IMMEDIATELY WASH CONTAMINATED SKIN WITH SOAP OR MILD DETERGENT & WATER. IF THIS CHEMICAL SOAKS CLOTHING, IMMEDIATELY REMOVE CLOTHING & WASH SKIN WITH SOAP OR MILD DETERGENT & WATER. GET MEDICAL ATTENTION PROMPTLY.

(3 OF 9)
IF THIS CHEMICAL GETS ON SKIN, IMMEDIATELY FLUSH CONTAMINATED SKIN WIT WATER. IF THIS CHEMICAL PENETRATES CLOTHING, IMMEDIATELY REMOVE THE CLOTHING AND FLUSH THE SKIN WITH WATER. GET MEDICAL ATTENTION PROMPTL

(4 OF 9)
WHEN THIS CHEMICAL HAS BEEN SWALLOWED, IMMEDIATELY GET MEDICAL ATTENTI IF MEDICAL ATTENTION IS NOT IMMEDIATELY AVAILABLE, GET THE AFFECTED PERSON TO VOMIT BY HAVING HIM TOUCH THE BACK OF HIS THROAT WITH HIS FINGER OR BY GIVING HIM SYRUP OF IPECAC AS DIRECTED ON PACKAGE. THIS NON-PRESCRIPTION DRUG SHOULD BE KEPT WITH EMERGENCY MEDICAL SUPPLIES I THE WORKPLACE AND IS AVAILABLE AT MOST DRUG COUNTERS. DO NOT MAKE AN UNCONSCIOUS PERSON VOMIT.

(5 OF 9)
IF THIS PHENOLIC COMPOUND IS SWALLOWED, IMMEDIATELY ADMINISTER ACTIVAT CHARCOAL AT A DOSAGE 5 TO 10 TIMES THE ESTIMATED WEIGHT OF THE SUBSTAN INGESTED OR AT LEAST 30 GRAMS OF ACTIVATED CHARCOAL DISSOLVED IN WATER DILUTE STOMACH CONTENTS WITH WATER OR MILK. CASTOR OIL (30 TO 60 ML) MAY BE ADMINISTERED TO REDUCE ABSORPTION OF CHEMICAL.

(6 OF 9)
SYRUP OF IPECAC - GIVE 15 ML (ONE TABLESPOON) OF SYRUP OF IPECAC FOLLOWED BY ONE-HALF GLASS OF WATER. IF EMESIS DOES NOT OCCUR IN THIR MINUTES, REPEAT WITH SAME DOSE. IF PATIENT MUST BE MOVED, KEEP IN HEAD-DOWN POSITION TO FACILITATE EMESIS AND PREVENT ASPIRATION OF VOMITUS. IF EMESIS DOES NOT OCCUR AFTER SYRUP OF IPECAC IS GIVEN, PERFORM GASTRIC LAVAGE TO PREVENT EMETINE POISONING. SAVE SPECIMENS O EMESIS FOR ANALYSIS. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

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(7 OF 9)
METHEMOGLOBINEMIA - GIVE 100% OXYGEN BY MASK IF PATIENT SHOWS SIGNS OF DYSPNEA OR AIR HUNGER. REMOVE POISON BY GASTRIC LAVAGE OR EMESIS FOLLOWED BY CATHARSIS. WASH SKIN THOROUGHLY WITH SOAP AND WATER. G

PERIOD. ADMINISTRATION OF METHYLENE BLUE MAY CAUSE HYPERTENSION, NAUSEA, AND DIZZINESS. LARGER DOSES (>500 MG) WILL CAUSE VOMITING, DIARRHEA, CHEST PAIN, MENTAL CONFUSION, CYANOSIS, AND SWEATING. HEMOLYTIC ANEMIA HAS OCCURED SEVERAL DAYS AFTER ADMINISTRATION. IF METHYLENE BLUE IS NOT AVAILABLE, GIVE ASCORBIC ACID, 1 G SLOWLY INTRAVENOUSLY. (ANTIDOTE MUST BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL) (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

(8 OF 9)
LIVER DAMAGE - REMOVE FROM EXPOSURE TO ALL CHEMICALS AND DRUGS. MAINTAIN COMPLETE BED REST. AVOID ANESTHESIA OR SURGICAL PROCEDURES. AVOID DEHYDRATION OR OVERHYDRATION. IF VOMITING SEVERE AND ORAL FLUIDS NOT RETAINED, REPLACE VOMITUS WITH AN EQUAL QUANTITY OF 100% DEXTROSE I NORMAL SALINE. IN RENAL FUNCTION ADEQUATE, GIVE 1 LITER OF 5% DEXTROSE OR INVERT SUGAR IN NORMAL SALINE PLUS 1-3 LITERS OF 10% DEXTROSE OR INVERT SUGAR IN DISTILLED WATER INTRAVENOUSLY EVERY TWENTY-FOUR HOURS. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

(9 OF 9)
ACUTE RENAL FAILURE - TREAT SHOCK. FOR HEMOLYTIC REACTIONS, GIVE SODIL BICARONATE, 5 G EVERY 1-2 HOURS AS NECESSARY TO MAINTAIN AN ALKALINE URINE. (MEDICATION MUST BE GIVEN BE QUALIFIED MEDICAL PERSONNEL) (DREISBACH, HANDBOOK OF POISONING, 11TH ED.).

DT

SPECIAL DIAGNOSTIC TESTS AND INDEXES OF EXPOSURE:
URINE PHENOL.
URINE PHENOL BEFORE WORK SHIFT ENDS, LIMIT LIQUID INTAKE.
CONVUL

ENTER DOCUMENT SELECTION.._:

END OF DOCUMENTS IN LIST_:

BRS SEARCH MODE - ENTER QUERY
3_:

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APPENDIX B

HEAT STRESS/COLD EXPOSURE

HIMCO DUMP SITE

CATEGORY:	TITLE:	No. HAS-9
Health and Safety	Heat Stress Control	DATE: 1/89
		REVISION: 0

CONTENTS

CATEGORY:	TITLE:	No. HAS-9
Health and Safety	Heat Stress Control	DATE: 1/89
		REVISION: 0

1.0 PURPOSE

This guideline provides procedures for the implementation and operation of a heat stress control program and applies to all field operations where personnel may be exposed to heat stress conditions.

2.0 DEFINITIONS

Wet-Bulb Globe Temperature (WBGT) - This is the simplest and most suitable technique to measure the environmental factors associated with heat stress. The value is calculated by using equations shown in Section 4.2.2 of this procedure.

Work-Rest Regimen - This is a ratio of time spent working versus time spent resting. The ratio applies to one-hour periods. For example, a work-rest regimen of 75% work, 25% rest corresponds to 45 minutes work, 15 minutes rest each hour.

3.0 RESPONSIBILITIES

All site personnel are responsible for (1) participating in the heat stress prevention program and (2) notifying their supervisor immediately whenever they are experiencing any signs or symptoms of heat stress.

Site Managers are responsible for (1) conducting heat stress monitoring whenever such monitoring is necessary to protect the health of their employees, and (2) establishing and maintaining a heat stress control program which shall include the requirements outlined in the following sections.

The Health and Safety Officer (HSO) is responsible for (1) providing overall program administration of the site heat stress control program; (2) advising appropriate operations management of potential heat stress hazards arising out of any current or proposed operation; (3) specifying the design and quality of heat stress monitoring devices and prescribed standards for heat stress monitoring and prevention; and (4) educating employees on the hazards of heat stress and the measures for controlling it.

CATEGORY:	TITLE:	No. HAS-9
Health and Safety	Heat Stress Control	DATE: 1/89
		REVISION: 0

4.0 GUIDELINES

4.1 EFFECTS OF HEAT STRESS

Adverse weather conditions are important considerations in planning and conducting site operations. Hot weather can cause physical discomfort, loss of efficiency, and personal injury. Of particular importance is heat stress resulting when protective clothing decreases natural body ventilation. Because of these factors, a heat stress evaluation procedure is essential to the health and safety of personnel conducting field work.

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild (such as fatigue; irritability; anxiety; and decreased concentration, dexterity, or movement) to fatal.

Heat-related problems include:

(1) Heat rash caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases the individual's ability to tolerate heat.

(2) Heat cramps caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.

(3) Heat exhaustion caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness; or lassitude.

(4) Heat stroke, the most severe form of heat stress. Body must be cooled immediately to prevent severe injury and/or death. Signs and symptoms: red, hot, dry skin;* no perspiration;* nausea; dizziness and confusion; strong, rapid pulse; or coma.

* NOTE: Personnel wearing vapor barrier protective clothing may not exhibit these symptoms. Their skin will be completely wetted with perspiration.

CATEGORY:	TITLE:	No. HAS-9
Health and Safety	Heat Stress Control	DATE: 1/89
		REVISION: 0

4.2 HEAT STRESS CONTROL

Heat stress can be controlled by instituting one or more of the following:

(1) Acclimatize the workers and explain the benefits of physical fitness.

(2) Reduce manual labor by mechanizing tasks. Using a backhoe instead of shoveling or using a crane to lift or move drums are examples of how mechanization can be used to reduce heat stress.

(3) Reduce the amount of time employees are working in a hot environment. Work/rest periods should be developed according to the results of the worker monitoring program. Other methods to reduce the employee exposure time include rotating personnel, performing work during cooler hours of the day, or adding personnel to work teams.

(4) Modify the thermal environment or shielding. Control of radiant heat gain is best accomplished by shielding. An example would be an umbrella to shade the worker from the sun (e.g., commercially available umbrellas for heavy equipment operations). Reducing heat gain from convection may be accomplished by supplying cooler air to the work environment. As a minimum, break areas, locker rooms, and lunchrooms should be located in shaded areas.

(5) Reduce the temperature of the rest area. The rest area should be maintained at a temperature of approximately 77°F.

(6) Make clothing modifications. Reducing the amount of time an employee is in full protective clothing will control heat stress.

(7) Replace fluids. Water and drinks should be available to employees so that fluid loss by sweating is replaced. Employees should be encouraged to drink more fluids when working in hot environments, since normal thirst mechanisms are not always sensitive enough to ensure adequate fluid replacement.

(8) Encourage workers to eat lightly at lunchtime and to eat cool meals rather than hot.

4.3 HEAT STRESS MONITORING

4.3.1 Work-Rest Regimen

In order to establish a proper work-rest regimen, the WBGT will be used in conjunction with an assessment of the work load required to perform each task. Examples of light work include sitting or standing to control machines or performing light hand or arm work. Moderate work includes walking about with moderate lifting and pushing or using coated protective coveralls and respirators. Heavy work corresponds to pick and shovel-type work or the use of full-body protective clothing. It must be assumed that any activity involving this type of clothing will be considered heavy work.

The work-rest regimen selected using the WBGT procedure will be used as a baseline. The actual or adjusted period of work will be determined based on the biological monitoring outlined in Section 4.3.3 of this procedure.

4.3.2 WBGT Determination

In order to determine the WBGT the following equations will be used:

- Outdoors with solar load:
  WBGT = 0.7 WB + 0.2 GT + 0.1 DB

- Indoors or outdoors with no solar load:
  WBGT = 0.7 WB + 0.3 GT

  Where:

  WB = Natural Wet-Bulb Temperature
  DB = Dry-Bulb Temperature
  GT = Globe Thermometer Temperature

CATEGORY:	TITLE:	No. HAS-9
Health and Safety	Heat Stress Control	DATE: 1/89
		REVISION: 0

The factors involved in the above equations can be measured in the following manner:

- Direct-reading heat stress monitor capable of measuring all of the individual factors associated with the WBGT equation (e.g., the Reuter-Strokes Wibget No. RSS-214 Heat Stress Monitor).

- By measuring the individual factors manually using the following type of equipment:

  - Dry-bulb thermometer
  - Natural wet-bulb thermometer
  - Globe thermometer
  - Stand

The measurement of the individual factors shall be performed as follows:

- The range of the dry and the natural wet-bulb thermometers shall be -5°C to 50°C with an accuracy of 0.5°C. The dry-bulb thermometer must be shielded from the sun and the other radiant surfaces of the environment without restricting the airflow around the bulb. The wick of the natural wet-bulb thermometer shall be kept wet with distilled water for at least 1/2 hour before the temperature reading is made. It is not enough to immerse the other end of the wick into a reservoir of distilled water and wait until the whole wick becomes wet by capillary. The wick shall be wetted by direct application of water from a syringe 1/2 hour before each reading. The wick shall extend over the bulb of the thermometer, covering the stem about one additional bulb length. The wick should always be clean, and new wicks shall be washed before using.

- A globe thermometer, consisting of a 15cm (6-inch) diameter hollow copper sphere painted on the outside with a matte black finish or equivalent, shall be used. The bulb sensor of a thermometer (range -5°C to 100°C with an accuracy of $\pm$0.5°C) must be fixed in the center of the sphere. The globe thermometer should be exposed at least 25 minutes before it is read.

- A stand shall be used to suspend the three thermometers so that they do not restrict free airflow around the bulbs, and the wet-bulb and globe thermometer are not shaded.

- It is permissible to use any other type of temperature sensor that gives identical readings as that of a mercury thermometer under the same conditions.

- The thermometers must be so placed that the readings are representative of the work and rest conditions. All readings shall be recorded on the site log.

4.3.3 Biological Monitoring

One of the following procedures should be followed when the workplace temperature is 70°F or above.

(1) Heart rate (HR) shall be measured by the pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 10 minutes (or 33 percent), while the length of rest period stays the same. If the pulse rate is 100 beats/minute at the beginning of the next rest period, the following work cycle should be shortened by 33 percent. The length of the initial work period will be determined by using the table below.

PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT VALUES
(VALUES ARE GIVEN IN °F WBGT)

	Work Load		
Work-Rest Regimen	Light	Moderate	Heavy
Continuous Work	80.0	80.0	77.0
75% Work - 25% Rest, Each Hour	87.0	82.4	78.6
50% Work - 50% Rest, Each Hour	88.5	85.0	82.2
25% Work - 75% Rest, Each Hour	90.0	88.0	86.0

CATEGORY:	TITLE:	No. HAS-9
Health and Safety	Heat Stress Control	DATE: 1/89
		REVISION: 0

(2) Body temperature should be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature (OT) at the beginning of the rest period should not exceed 99°F. If it does, the next work period should be shortened by 10 minutes (or 33 percent), while the length of the rest period stays the same. However, if the OT exceeds 99.7°F at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. OT should be measured at the end of the rest period to make sure that is has dropped below 99°F. At no time shall work begin with OT above 99°F.

5.0 ATTACHMENTS

None.

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CATEGORY: Health and Safety	TITLE: Cold Stress Control	No. HAS-10 DATE: 1/89 REVISION: 0

3.0 RESPONSIBILITIES

All site personnel should be alert to signs of cold stress in those working with them and should be aware of emergency action and first aid treatment for cold stress.

The Health and Safety Officer is responsible for implementing a cold stress control program according to this guideline. The HSO is charged with enforcing the work/warmup regimen to control cold stress.

4.0 GUIDELINES

4.1 INTRODUCTION

When the human body is exposed to a cold environment, certain physiologic mechanisms come into play which tend to limit heat loss and increase heat production. The first mechanism reduces the amount of heat lost to the environment by constricting the blood vessels, especially in the extremities, resulting in a marked drop in skin temperature. Chilling of the extremities places a severe strain on this mechanism, and if activity is restricted, the toes and fingers may approach freezing temperatures very rapidly. When vasoconstriction is no longer adequate to maintain body heat balance, metabolic heat production is augmented by voluntary movements and by the onset of shivering. It is possible to increase the metabolic rate five to seven times for short periods by shivering, but this increase cannot be maintained indefinitely. These two mechanisms reduce the blood flow through the skin and thus lower the temperature so that less heat is lost by conduction and radiation. Reduction of surface area by changes in posture, such as curling up the body, also assists in reducing heat loss.

Persons working outdoors in temperatures at or below freezing may experience frostbite. Extreme cold for a short time may cause severe injury to the surface of the body. Areas of the body that have a high surface area to volume ratio, such as fingers, toes, and ears, are the most susceptible.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind chill (Attachment A) is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10°F with a wind of 15 mph is equivalent in chilling effect to still air at -18°F.

CATEGORY: Health and Safety	TITLE: Cold Stress Control	No. HAS-10 DATE: 1/89 REVISION: 0

As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is soaked with perspiration.

4.2 FROSTBITE

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

(1) Frost nip or incident frostbite - The condition is characterized by sudden blanching or whitening of skin.

(2) Superficial frostbite - Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.

(3) Deep frostbite - Tissues are cold, pale, and solid; extremely serious injury.

4.3 HYPOTHERMIA

Authorities agree that there are degrees of hypothermia which are characterized as "moderate" and "severe." A victim of moderate hypothermia exhibiting the first seven signs listed in 4.3.1 is still conscious but often confused. Severe hypothermia is determined by extreme skin coldness, loss of consciousness, faint pulse, and shallow, infrequent, or apparently absent respiration. Death is the ultimate result (see Attachment B).

Practically, the onset of severe shivering signals danger to personnel. Exposure to cold shall be immediately terminated for any severely shivering worker.

4.3.1 Signs of Hypothermia

The following symptoms are signs of hypothermia:

(1) Severe shivering
(2) Abnormal behavior
(3) Slowing
(4) Stumbling

(5) Weakness
(6) Repeated falling
(7) Inability to walk
(8) Collapse
(9) Stupor
(10) Unconsciousness

4.4 EMERGENCY ACTION

Emergency action should consist of the following:

(1) Remove the victim from the hypothermia/frostbite-producing environment.

(2) Seek expert medical help immediately.

(3) Reduce handling to a minimum. Do not rub or massage the victim.

(4) Prevent further body heat loss by covering the victim lightly with blankets. Plastic may be used for further insulation. Do not cover the victim's face.

(5) If the victim is still conscious, administer hot drinks; encourage activity, such as walking while wrapped in a blanket; and do not administer any form of sedative, tranquilizer or analgesic (pain reliever), because these may facilitate further heat loss and convert moderate hypothermia into a severe case.

4.5 WORKPLACE MONITORING

Workplace monitoring is required as follows:

(1) A thermometer accurate to 1°F should be assigned at any work place where the environmental temperature is known or expected to be below 60°F to enable overall compliance with the requirements of this policy.

(2) Whenever the air temperature at a work place falls to 30°F or below, the dry-bulb temperature and wind speed should be measured and recorded at least every four hours.

CATEGORY: Health and Safety	TITLE: Cold Stress Control	No. HAS-10 DATE: 1/89 REVISION: 0

(3) The equivalent chill temperature should be obtained from the table in Attachment A in all cases where air movement measurements are required, and should be recorded with the other data in the site log, together with a record of the length of time spent working and resting.

4.6 WORK-WARMING REGIMEN

If work is performed continuously in the cold at an ECT of 20°F or below, heated warming shelters should be made available for use by employees during warmup breaks. A work-warming regimen will be established using the table presented in Attachment C. This table assumes that all workers are properly clothed for periods of work at temperatures below freezing.

When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing loosened to permit sweat evaporation. A change of dry work clothing should be provided as necessary to prevent workers from returning to their work with wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should not be permitted because of a diuretic and circulatory effect.

For work practices at or below 10°F ECT, the following shall apply:

(1) The worker should be under constant protective observation (buddy system or other direct supervision).

(2) The work rate should not be so high as to cause sweating that will result in wet clothing; if heavy work must be done, all rest periods must be taken in heated shelters and the opportunity for changing into dry clothing should be provided.

(3) Provision should be made for time to allow employees to become accustomed to the working conditions and required protective clothing.

(4) The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the worker.

(5) The work should be arranged in such a way that sitting still or standing still for long periods is minimized.

(6) Unprotected metal chair seats must not be used. The worker should be protected from drafts to the greatest extent possible.

(7) The workers should be instructed in cold weather procedures. The training program should include at a minimum instruction in:

- Rewarming procedures and appropriate first aid treatment.
- Proper clothing practices.
- Proper eating and drinking requirements for cold stress.
- Recognition of impending frostbite.
- Recognition of signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur.
- Safe work practices.

4.7 SPECIAL MEDICAL CONSIDERATIONS

Employees must be excluded from work in cold at 30°F or below if they are suffering from diseases or taking medication which interfere with normal body temperature regulation or reduce tolerance to work in cold environments. The HSO shall document this information for each worker during site training. Workers who are routinely exposed to extreme cold stress conditions should be medically certified as suitable for such exposures.

Trauma sustained in freezing or subzero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment.

For exposed skin, continuous exposure will not be permitted when ECT of -25°F is anticipated.

CATEGORY: Health and Safety	TITLE: Cold Stress Control	No. HAS-10 DATE: 1/89 REVISION: 0

At air temperatures of 36°F or less, any worker who becomes immersed in water or whose clothing becomes wet will be immediately provided a change of clothing and be treated for hypothermia.

4.8 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Since prolonged exposure to cold air (or to immersion in cold water) at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided as follows:

(1) Adequate insulating clothing to maintain core temperatures above 97°F must be provided to workers if work is performed in air temperatures below 40°F. Wind chill or the cooling power of the air is a critical factor. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required. An equivalent chill temperature chart relating the actual dry bulb air temperature and the wind velocity is presented in Attachment A. The equivalent chill temperature must be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.

(2) Older workers or workers with circulatory problems require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions which should be considered. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

(3) Special protection of the hands is required to maintain manual dexterity as follows:

- If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 60°F, special provisions must be established for keeping the worker's hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be used. Metal

handles of tools and control bars should be covered by thermal insulating material at temperatures below 30°F.

- If the air temperature falls below 60°F for sedentary, 40°F for light, or 20°F for moderate work and fine manual dexterity is not required, then gloves should be used by the workers.

(4) To prevent contact frostbite, the workers must wear anti-contact gloves and follow the provisions shown below:

- When cold surfaces below 20°F are within reach, a warning should be given to each worker by his/her supervisor to prevent inadvertent contact by bare skin.

- If the air temperature is 0°F or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.

(5) Provisions for additional total body protection is required if work is performed in an environment at or below 40°F. The workers should wear cold protective clothing appropriate for the level of cold and physical activity:

- If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable outer windbreak garment.

- If only light work is involved and if the clothing on the workers may become wet on the job site, the outer layer of the clothing in use should be of a type impermeable to water. The outer garments must include provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If work is done at normal temperatures or in a hot environment before entering the cold area, employees should make sure that their clothing is not wet as a consequence of sweating. If clothing is wet, employees should

CATEGORY: Health and Safety	TITLE: Cold Stress Control	No. HAS-10 DATE: 1/89 REVISION: 0

change into dry clothes before entering the cold area. The workers should change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots. The optimal frequency of change should be determined empirically and will vary individually and according to the type of shoe worn and how much each individual's feet sweat.

- If extremities, ears, toes, and nose cannot be protected sufficiently to prevent sensation of excessive cold or frostbite by use of conventional handwear, footwear, and face masks, auxiliary heated versions of these protective items should be provided.

- If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.

- Workers handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of "cryogenic fluids" or those liquids with a boiling point just above ambient temperatures.

5.0 ATTACHMENTS

Attachment A - Cooling Power of Wind on Exposed Flesh Expressed As An Equivalent Temperature

Attachment B - Signs of Hypothermia

Attachment C - Work-Warming Regimen

ATTACHMENT A

COOLING POWER OF WIND ON
EXPOSED FLESH

Cooling Power of Wind on Exposed Flesh Expressed as an equivalent Temperature (under calm conditions)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	*LITTLE DANGER* In < hr with dry skin. Maximum danger of false sense of security				*INCREASING DANGER* Danger from freezing of exposed flesh within one minute.				*GREAT DANGER* Flesh may freeze within 30 seconds.			
	Trenchfoot and immersion foot may occur at any point on this chart.											

* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

ATTACHMENT B

SIGNS OF HYPOTHERMIA

SIGNS OF HYPOTHERMIA

Core Temperature °C	Core Temperature °F	Clinical Signs
37.6	99.6	"Normal" rectal temperature
37	98.6	"Normal" oral temperature
36	96.8	Metabolic rate increases in an attempt to compensate for heat loss
35	95.0	Maximum shivering
34	93.2	Victim conscious and responsive, with normal blood pressure
33	91.4	Severe hypothermia below this temperature
32 / 31	89.6 / 87.8	Consciousness clouded; blood pressure becomes difficult to obtain; pupils dilated but react to light; shivering ceases
30 / 29	86.0 / 84.2	Progressive loss of consciousness; muscular rigidity increases; pulse and blood pressure difficult to obtain; respiratory rate decreases
28	82.4	Ventricular fibrillation possible with myocardial irritability
27	80.6	Voluntary motion ceases; pupils nonreactive to light; deep tendon and superficial reflexes absent
26	78.8	Victim seldom conscious
25	77.0	Ventricular fibrillation may occur spontaneously
24	75.2	Pulmonary edema
22 / 21	71.6 / 69.8	Maximum risk of ventricular fibrilation
20	68.0	Cardiac standstill
18	64.4	Lowest accidental hypothermia victim to recover
17	62.6	Isoelectric electroencephalogram
9	48.2	Lowest artificially cooled hypothermia patient to recover

ATTACHMENT C

WORK/WARMUP SCHEDULE FOR
4-HOUR SHIFT

WORK/WARM-UP SCHEDULE FOR 4-HOUR SHIFT*

	Air Temp. Sunny Sky °F	No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
		Max. No. of Period	Work Breaks	Max. No. of Period	Work Breaks	Max. No. of Period	Work Breaks	Max. No. of Period	Work Breaks	Max. No. of Period	Work Breaks
1.	-15° to -19°	(Norm Breaks)	1	(Norm. Breaks)	1	75 min	2	55 min	3	40 min	4
2.	-20° to -24°	(Norm Breaks)	1	75 min	2	55 min	3	40 min	4	30 min	5
3.	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	
4.	-30° to -34°	55 min	3	40 min	4	30 min	5	Non-emergency work should cease			
5.	-35° to -39°	40 min	4	30 min	5	Non-emergency work should cease					
6.	-40° to -44°	30 min	5	Non-emergency work should cease							
7.	-45° & below	Non-emergency work should cease									

NOTES:

1. Schedule applies to moderate to heavy work activity with warm-up breaks of 10 minutes in a warm location. For Light-to-Moderate Work (limited physical movement), apply the schedule one step lower. For example, at -30°F with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with four breaks in a 4-hour period (Step 5).

2. The following is suggested as a guide for estimating wind velocity. If accurate information is not available: 5 mph: light flag moves; 10 mph: light flag fully extended; 15 mph: raises newspaper sheet; 20 mph: blowing and drifting snow.

*From Occupational Health & Safety Division, Saskatchewan Department of Labour.

APPENDIX C

RESPIRATOR PROGRAM

HIMCO DUMP SITE

APPENDIX C

RESPIRATOR PROGRAM FOR HIMCO DUMP SITE

1. The following respirator program is in accordance with OSHA 29 CFR 1910.134 Respiratory Protection Program requirements. This program governs the selection and use of respirators on the Himco Dump site.

2. Respirators for the field sampling team will be provided by Donohue & Associates, Inc. The respirator protection program will be administered by, and is the responsibility of the Health and Safety Officer (HSO) and/or Assistant HSO for the Himco Dump site. Subcontractors (i.e., drillers) will furnish their own respirators and medical surveillance for their employees. The HSO and/or Assistant HSO will be responsible for ensuring that they are in compliance with this respirator program.

3. The respirators will be selected according to the hazard and level of protection determined by monitoring action levels and the decision of the HSO and/or the Assistant HSO. The respirators and levels are:

Level	Respirator
	The determination of level will be based on air monitoring results using an HNu and/or OVA and Lumidor.
B	Positive Pressure-Pressure Demand SCBA or Supplied Air Respirator with 5 minute escape bottle. Level B is 5 to 500 ppm above background in breathing zone (BZ) on the HNu/OVA, or >10 ppm HAS on the Lumidor.
C	Full-face air purifying respirator with combination dust (HEPA) and organic vapor/acid gas cartridge. Level C is 1 to 5 ppm above background in BZ. The full facepiece respirator with combination dust and organic vapor/acid gas cartridge will be appropriate for the dust conditions and organics that may be encountered.
D	No respirator required. Level D is 1.0 ppm above background or less in the worker's BZ.

4. The respirator users will be fit tested with the size, style, and make of the respirator they will be using on-site. The fit test will be recorded and these Fit Test Records (see next page) will be maintained in the Command Post.

5. Employee respirator training is provided on an annual basis and at site-specific training sessions. This training includes:

   a) A discussion of the nature of the respiratory hazards and the dangers if the respirator is not used properly.

b) The reasons that respirators are required for protection, along with any engineering controls that may be used.

c) Instruction in the selection, use, sanitary care, maintenance, proper storage, and limitation of the full facepiece respirator with combination cartridge, and the SCBA.

d) Practice in proper fitting, wearing, adjusting, and checking face seal of the respirator.

e) An opportunity to handle the respirator.

f) Instruction on how to recognize and cope with emergency situations requiring respiratory protection.

g) Explanation of the requirements for a self-contained breathing device for work in unknown concentrations and Immediately Dangerous to Life or Health (IDLH) atmosphere and for fire fighting.

h) Explanation of the medical surveillance program and how it relates to respirator use.

i) Explanation of the requirements for maintaining a tight seal, why beard and facial hair is prohibited, and why use of contact lenses while wearing respirators is prohibited.

6. Respirators will be assigned to individual workers. Each individual shall be responsible for cleaning and maintaining their assigned respirator. They will be cleaned and disinfected before being reassigned. Respirators will be cleaned after each day of work according to manufacturer's instruction. The cleaning will be done at the Command Post. Used cartridges will be disposed of and replaced with new ones.

7. After cleaning, the respirators will be inspected and checked for defects such as excessive dirt, cracks or other distortions, scratches, incorrectly mounted lens, broken or worn cartridge holders on the facepiece, breaks, loss of elasticity, broken buckles, and excessively worn serrations on head harness that may cause slippage on the headstraps or head harness.

   Further checks include:

   a) A check of the tightness of the connections.

   b) A check of the facepiece, valves, connecting tube, and canisters.

   c) A check of the regulator and warning devices on SCBA for proper functioning.

d) For air purifying:

(1) Check the exhalation valve after removing its cover for:

- Foreign material, such as detergent residue, dust particles, or human hair under the valve seat
- Cracks, tears, or distortion in the valve material
- Improper insertion of the valve body in the facepiece
- Cracks, breaks, or chips in the valve body, particularly in the sealing surface
- Missing or defective valve cover
- Improper installation of the valve in the valve body.

(2) Check the air purifying elements for:

- Incorrect cartridge, canister, or filter for the hazard
- Incorrect installation, loose connections, missing or worn gaskets, or cross threading in holder
- Expired shelf life of cartridge or canister
- Cracks, dents, or breaks in the cartridge or canisters case
- Evidence of prior use of cartridge or canister, such as broken seal tape foil or other sealing material.

(3) Check the corrugated breathing tube for:

- Broken or missing end connectors, gaskets, or O-rings
- Missing or loose hose clamp
- Deterioration (done by stretching hose and looking for cracks).

e) For air supplied respirators check the air supply system for:

(1) Integrity and condition of air supply lines and hoses, including attachments and end fitting

(2) Correct operation and condition of all regulators, valves, or other air-flow regulators

(3) If SCBA, that the cylinder is sufficiently charged for the intended use, preferably fully charged (mandatory on an emergency device). The emergency SCBA will have a tag for logging in the monthly inspections.

8. Monitoring of the work area will be performed and the results will be used to select the appropriate level of protection. Refer to air monitoring section of the HASP (Section 9.0).

9. This program will be re-evaluated and revisions and updates added regularly.

10. Persons will not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The Donohue contracted physician will determine what health and physical conditions are pertinent.

11. Only those respirators jointly approved by NIOSH/MSHA shall be used. All component parts (i.e., canister, replacement straps, etc.) will be of the same make.

APPENDIX D

FIRST AID FOR SNAKE BITES

FIRST AID FOR SNAKE BITES

Keep the victim quiet and reassure him/her. Transport the victim to a source of medical assistance as quickly as possible.

1. Immobilize the arm or leg in a lowered position, keeping the involved area below the level of the victim's heart.

2. If the bite is on an arm or leg, apply a constricting band from 2 to 4 inches above the bite, between the wound and the victim's heart. The constricting band should not be tight. You should be able to slip your index finger under the band when it is in place.

3. Use the blade in a snake bite kit, if available; otherwise, sterilize a knife blade with a flame, and make incisions through the skin at each fang mark and over the suspected venom deposit point. (The snake strikes downward, and the deposit point will be lower than the fang marks.) Be very careful to make the incisions through the skin only and in the long axis of the limb. Do not make cross-cut incisions. The incisions must not be deeper than the skin because of the danger of severing muscles and nerves. Special care is necessary in making incisions on the hand, wrist, or foot, because muscles, nerves, and tendons lie close to the surface, and the injury may cause considerable disability. Do not make incisions more than one-half inch long.

4. Apply suction with the suction cup contained in the snake bite kit, if available; otherwise, use your mouth. Snake venom is not a stomach poison but it should not be swallowed, and you should rinse it from your mouth. Continue suction for from 30 to 60 minutes. If swelling extends up to the constricting band, apply another band a few inches above the first, but leave the first band in place.

5. Wash the wound thoroughly with soap and water and blot dry. Apply a sterile or clean dressing and bandage it in place.

6. You may place a cold, wet cloth or ice wrapped in a cloth, if available, over the would for slow absorption but do not pack the wound in ice.

7. Do not give alcohol in any form.

8. Treat the victim for shock. Unless nausea and vomiting develop, sips of fluid may be given if the victim is conscious and can swallow without difficulty.

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9. Give artificial respiration if indicated.

10. Consult a physician with regard to antibiotic therapy and prevention of tetanus, even if the bite has been inflicted by a nonpoisonous snake.

11. If the victim must walk, make sure that he moves slowly.

12. Telephone ahead to the nearest hospital or doctor so that antivenin can be made available quickly.

APPENDIX E

OSHA POSTER

JOB SAFETY & HEALTH PROTECTION

The Occupational Safety and Health Act of 1970 provides job safety and health protection for workers by promoting safe and healthful working conditions throughout the Nation. Requirements of the Act include the following:

Employers

All employers must furnish to employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Employers must comply with occupational safety and health standards issued under the Act.

Employees

Employees must comply with all occupational safety and health standards, rules, regulations and orders issued under the Act that apply to their own actions and conduct on the job.

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor has the primary responsibility for administering the Act. OSHA issues occupational safety and health standards, and its Compliance Safety and Health Officers conduct jobsite inspections to help ensure compliance with the Act.

Inspection

The Act requires that a representative of the employer and a representative authorized by the employees be given an opportunity to accompany the OSHA inspector for the purpose of aiding the inspection.

Where there is no authorized employee representative, the OSHA Compliance Officer must consult with a reasonable number of employees concerning safety and health conditions in the workplace.

Complaint

Employees or their representatives have the right to file a complaint with the nearest OSHA office requesting an inspection if they believe unsafe or unhealthful conditions exist in their workplace. OSHA will withhold, on request, names of employees complaining.

The Act provides that employees may not be discharged or discriminated against in any way for filing safety and health complaints or for otherwise exercising their rights under the Act.

Employees who believe they have been discriminated against may file a complaint with their nearest OSHA office within 30 days of the alleged discrimination.

Citation

If upon inspection OSHA believes an employer has violated the Act, a citation alleging such violations will be issued to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

The OSHA citation must be prominently displayed at or near the place of alleged violation for three days, or until it is corrected, whichever is later, to warn employees of dangers that may exist there.

Proposed Penalty

The Act provides for mandatory penalties against employers of up to $1,000 for each serious violation and for optional penalties of up to $1,000 for each nonserious violation. Penalties of up to $1,000 per day may be proposed for failure to correct violations within the proposed time period. Also, any employer who willfully or repeatedly violates the Act may be assessed penalties of up to $10,000 for each such violation.

Criminal penalties are also provided for in the Act. Any willful violation resulting in death of an employee, upon conviction, is punishable by a fine of not more than $10,000, or by imprisonment for not more than six months, or by both. Conviction of an employer after a first conviction doubles these maximum penalties.

Voluntary Activity

While providing penalties for violations, the Act also encourages efforts by labor and management, before an OSHA inspection, to reduce workplace hazards voluntarily and to develop and improve safety and health programs in all workplaces and industries. OSHA's Voluntary Protection Programs recognize outstanding efforts of this nature.

Such voluntary action should initially focus on the identification and elimination of hazards that could cause death, injury, or illness to employees and supervisors. There are many public and private organizations that can provide information and assistance in this effort, if requested. Also, your local OSHA office can provide considerable help and advice on solving safety and health problems or can refer you to other sources for help such as training.

Consultation

Free consultative assistance, without citation or penalty, is available to employers, on request, through OSHA supported programs in most State departments of labor or health.

More Information

Additional information and copies of the Act, specific OSHA safety and health standards, and other applicable regulations may be obtained from your employer or from the nearest OSHA Regional Office in the following locations:

Atlanta, Georgia
Boston, Massachusetts
Chicago, Illinois
Dallas, Texas
Denver, Colorado
Kansas City, Missouri
New York, New York
Philadelphia, Pennsylvania
San Francisco, California
Seattle, Washington

Telephone numbers for these offices, and additional area office locations, are listed in the telephone directory under the United States Department of Labor in the United States Government listing.

Washington, D.C.
1985
OSHA 2203

William E. Brock, Secretary of Labor

U.S. Department of Labor
Occupational Safety and Health Administration

Under provisions of Title 29, Code of Federal Regulations, Part 1903.2(a)(1) employers must post this notice (or a facsimile) in a conspicuous place where notices to employees are customarily posted.